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OF

THE BRITISH ISLES

BY

A. J. HERBERTSON, PH.D., F.R.G.S.

ASSISTANT TO THE READER IN GEOGRAPHY IN THE UNIVERSITY OF OXFORD,
AND ASSISTANT-EDITOR OF THE 'JOURNAL OF SCHOOL GEOGRAPHY';
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P R E F A C E.

THE present book has grown out of the courses of lectures on Commercial Geography given by the author during the last three years in the Heriot-Watt College, Edinburgh. The chapter on trade-routes summarises a short course given in Manchester in connection with the Owens College and the Geographical Society.

The book is intended for teachers of Commercial Geography who begin with a study of the Commercial Geography of the British Isles, and especially for those who follow the Evening Continuation Code of the Education Department. One word of warning is perhaps necessary. The whole of the details given are not intended to be learnt by heart. Figures are frequently quoted merely for purposes of comparison, to illustrate the relative importance of different branches of production and trade.

Commercial Geography cannot be understood without a grasp of geographical principles and their economic bearings. In this connection the perusal of Dr Keltie's suggestive little book on *Applied Geography* is recommended. The study of recent trade and consular reports in the light of geographical principles is an admirable exercise. The *Statesman's Year-Book*, or some similar statistical annual, the monthly *Board of Trade Journal*, and the new admirable weekly commercial newspaper, *Sell's Commercial Intelligence*, should be in the hands of every teacher who desires to bring his information up to date. The *Shipping World Year-Book* is useful for information regarding ports and tariffs. Such works should constantly be placed in the hands of students, who should be encouraged in every possible way to deal with information at first hand.

In preparing this book free use has been made of the numerous articles in *Chambers's Encyclopaedia*, to which teachers are referred for fuller information. Mr Chisholm's *Handbook of Commercial Geography* and his *Gazetteer* have also been used; while most of the statistics have been taken either from Government Reports or from the 1899 edition of the *Statesman's Year-Book*.

COLINTON, MIDLOTHIAN, 1899.

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AGRICULTURAL DIVISIONS OF GREAT BRITAIN.

DIVISIONS.	AGRICULTURAL DIVISIONS AND SUBDIVISIONS.	Total Area of Land and Water.	Returned as under Woods and Plantations in 1895.	Returned as						
				Acres.	%	Estimated Area of Mountain and Heath Land used for Grazing.	Permanent Pasture.	Acres.	%	Acres.
I.	(a.) Beds, Hunts, Cambs., Suffolk, Essex, Herts., Middlesex, London.	3,647,000	118,000	35,000	9	956,000	26·2	2,034,000	55·7	
	(b.) Norfolk, Lincoln, York, E.R.	3,765,000	114,000	43,000	1·1	992,000	26·3	2,270,000	60·2	
II.	(a.) Kent, Surrey, Sussex, Berks, Hants.	3,882,000	439,000	11·3	127,000	3·2	1,369,000	35·2	1,413,000	36·3
	(b.) Notts, Leicester, Rutland, Northampton, Bucks, Oxford, Warwick.	3,349,000	154,000	4·5	5,000	1	1,710,000	51·0	1,169,000	34·9
III.	(a.) Salop, Worcester, Gloucester, Wilts, Monmouth, Hereford, Dorset, Devon, Cornwall.	3,899,000	255,000	6·5	91,000	2·3	1,990,000	50·7	1,227,000	31·4
	(b.) Somerset, Dorset, W.R.	4,205,000	200,000	4·7	270,000	6·4	1,806,000	42·9	1,351,000	32·1
IV.	(a.) Northumberland, Durham, York, N.R., York, W.R.	5,072,000	202,000	3·9	1,025,000	20·1	2,092,000	41·2	1,122,000	22·1
	(b.) Cumberland, Westmorland, Lancashire, Stafford, Cheshire, Derby.	4,725,000	184,000	3·8	613,000	12·9	2,277,000	48·1	1,016,000	21·5
V.	Wales (12 counties).....	4,774,000	182,000	3·8	1,154,000	24·1	1,930,000	40·4	903,000	18·9
VI.	Scotland (East).....	6,546,000	457,000	6·9	2,177,000	33·2	519,000	7·9	2,170,000	33·1
VII.	Scotland (West).....	12,909,000	421,000	3·2	7,280,000	56·3	872,000	6·7	1,332,000	10·3
	Great Britain.....	56,773,000	2,726,000	4·8	12,820,000	22·2	16,513,000	29·0	16,007,000	28·1

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INTRODUCTION.



ECONOMIC, or, as it is more often called, Commercial Geography, deals with the distribution of things of economic importance. It regards geography from the point of view of men's activities in getting food, shelter, and other material goods, and neglects all other aspects of the subject. The river Mersey, for instance, is of interest in Economic Geography, not because it rises in the Pennines and flows westward to the Irish Sea, but because its waters are available for turning machinery, for scouring, bleaching, and dyeing, and because its estuary forms one of the great water-ways of the world. The Pennines themselves are important because of the grass on their sides, which feeds sheep, and because of the coal in their flanks, which is used as fuel in mills and houses, in the engines which convey freight between mills and markets, and in the steamers which sail from Liverpool and other neighbouring ports.

Economic geography, therefore, must take into account the geographical conditions which help man to make a living. The sea supplies fish and salt, and

is a pathway for his ships. The rivers supply water for domestic and industrial use, and, if navigable, afford an easy and cheap means of transport. The plains yield food for man and beast; the hills are pasture grounds; the very rocks yield stone for building purposes, clay for bricks, coal for fuel, iron and other metals for the necessary implements of manufacture and transport.

The occupations of men, therefore, have a natural distribution. On the coast they become fishers, sailors, or traders; on the plains, farmers; on the hills, shepherds; while mining and other industries depending upon coal and iron spring up where these sources of natural wealth are available.

Looking at a physical map of the British Isles, the south-east of Great Britain and the centre of Ireland are seen to be plains; the northern half of Great Britain and all the west and the corners of Ireland are generally mountainous, with plains of small extent. The south-east and east of Great Britain, therefore, are mainly agricultural, and the west mainly pastoral.

Agriculture is more developed in Ireland on the central plain than in the mountains to the north-west and south, but cattle-rearing is everywhere more important than the cultivation of the soil. This is largely due to the heavy rains, an illustration of the fact that climate as well as relief helps to determine the nature and distribution of occupations.

For many centuries minerals played a comparatively unimportant part in the economics of our island, except in the extreme south-west, where tin early attracted foreign traders to Cornwall. Salt was much in demand for preserving meat for the winter, and continued to

be so until the development of transport rendered the produce of distant markets available at all seasons of the year. At the dawn of history in Britain much of the land was uncleared forest, and hunting and fishing were the chief occupations. In Roman times the country must still have been densely wooded, for we find some of the main Roman roads leading over the bare mountain-tops, which were easier to cross than the wooded land below. In the regions that had been cleared of trees agriculture developed, and corn was exported to the Continent. Forest clearing, however, is a slow process, and for many centuries the chief product was wool from the numerous sheep which fed on the grassy slopes of the unwooded uplands. With the gradual clearing of the forests, agriculture became more and more important, but sheep-rearing remained the staple industry. The wool was not, however, manufactured at home, but was exported to Flanders. More than one English monarch attempted to introduce the woollen industry, and from time to time numbers of Flemish weavers settled in this country.

As the forests were gradually cut down and timber became scarcer, coal was increasingly used for fuel, and its consumption was enormously increased by the application of steam to machinery in the eighteenth century. The demand for machinery which sprang up at that time reacted on the iron industry, and led to the diversion of much land to industrial uses. Home production of raw material no longer sufficed for the rapid development of industry.

Meanwhile, although the population increased rapidly, the proportion of those engaged in raising food diminished, and the home food-supply became

quite inadequate. Foreign trade, therefore, had a twofold object—to dispose of the surplus commodities, and to supply the deficiency of raw material and food. Hence the paramount importance of trade, home and foreign, to our country, and the taunt sometimes levelled against us that we are a 'nation of shopkeepers.'

In studying the economic geography of Britain, therefore, we have to consider the geographical conditions as they affect such primary occupations as fishing, the rearing of animals, or the tilling of the soil; to explain the reasons for the distribution of its industries and industrial cities; and to describe the great internal trade-routes, the great ports, and the commodities carried in the ships that enter and leave them.

CHAPTER I.

PHYSICAL CONDITIONS OF BRITAIN.

Mountains, Plains, Rivers, and Coasts.—The physical features of the British Isles are of great economic importance. The high land of Great Britain lies in the west; the low land occupies the south-east and is nearest to the Continent of Europe. Ireland, farther removed from the Continent, is more or less isolated, and its east coast, which is nearest Great Britain, has few good harbours.

A line from the Exe to Whitby divides Great Britain into two parts—an older, hillier, northern and western part, and a younger, flatter, southern and

eastern part. The south-eastern plain reaches the west coast only at the Bristol Channel, and across the Cheshire plain to the Dee and the Mersey. These outlying portions of the plain separate the Cornish Heights from the Welsh Mountains, and the Welsh Mountains from the Pennine Uplands and the Mountains of Cumberland respectively. Farther north, the Central Lowlands of Scotland divide the higher ground into the Southern Uplands and the Highlands of Scotland, and permit communication from east to west. The long, narrow depression of Glenmore divides the South-east from the Northwest Highlands.

Each of these regions of lower land, permitting ready communication from east to west of the island, is of great economic importance. In the case of England, the Bristol Channel serves as an outlet to the west through Bristol, Gloucester, Newport, Cardiff, and Swansea, corresponding to the estuary of the Thames, where London is the centre, on the east. Even more important is the flat Cheshire plain, which permits communication with the central plains of England. The Mersey estuary, with the great port of Liverpool, on the west coast, corresponds to that of the Humber, with Grimsby, Hull, and Goole, on the east coast. The Cheviot Hills and the Southern Uplands of Scotland practically shut off all communication between the two seas, and block the route to the north along the east coast, which is flat and easily traversed south of them. The great firths of the Forth and the Tay on the east, and of the Clyde on the west, stretch far into the heart of the Lowlands, and permit products to be easily received and distributed through Glasgow,

Greenock, and other west-coast ports, and through Leith, Grangemouth, Dundee, and other east-coast ports. This is the place to cut a great ship-canal across Great Britain, which would join the Clyde and the Forth, and prove of great commercial, as well as of great strategic, importance. The narrow depression of Glenmore is relatively unimportant from an economic point of view, as it is entirely in a mountainous region, and connects no great fertile plains or busy industrial districts.

From north to south the east coast is bounded by comparatively flat land, which is interrupted only by the Southern Uplands and the South-east Highlands approaching close to the sea, and by the Forth and the Tay, which necessitated long detours round their estuaries before these were bridged. Communication from the Thames almost to the very north of Great Britain has long been possible across the flat land along the east coast. The eastern barriers are not so formidable as those on the west coast, where communication was obstructed north of Lancashire by the Cumbrian Mountains, then by the Southern Uplands of Scotland, and lastly by the great extent of the Highlands. The lands around the Solway Firth could be reached only by the difficult route from the south between the Pennines and the Cumbrian Mountains, by the North Tyne from the east, or by the valleys of the Liddel, the Annan, and the Nith, which formed the equally difficult passes to the north. The valleys of the Tay and the Spey form passes across the centre of the South-east Highlands. The railways now traverse these, the easiest tracks across a difficult country.

The rocky, mountainous western coasts have many drowned valleys which form excellent harbours, but the lack of easy communication with the busy parts of the country makes most of these harbours comparatively unimportant, though Milford Haven forms a packet and naval station. The exceptions are where the estuaries are found in the western flat lands, and these are of the greatest importance now that the Atlantic Ocean has become a great highway for trading-ships. The chief are the Clyde, which reaches into the Lowlands of Scotland; the Mersey, which indents the Cheshire plain, across which the Weaver serves as a waterway; and the Bristol Channel, with the canalised Severn and the Warwickshire Avon communicating with the heart of England.

On the east coast, on the other hand, there are few good harbours except in the estuaries of the great tidal rivers and in the firths of eastern Scotland. The Tay and the Forth reach into the heart of the Scottish Lowlands. The Aberdeenshire Dee, the Tyne, and the Tees, though navigable only near their mouths, are outlets for important industrial regions. The Humber, the Wash, and the Thames are the most important in the south, and the chief waterways of the English plain reach the sea by them. The Humber is connected by the Yorkshire Ouse and the Trent with the flat lands of the north-east and centre of England. Parts of the Yorkshire Ouse and its tributaries, and almost the entire length of the Trent, have been rendered navigable by canalisation. The shallow Wash extends into the marshy Fenland, across which sluggish rivers like the Welland and the Great Ouse, now canalised, form waterways. The

Thames valley breaks through the line of chalk heights between the Marlborough and the Chiltern Hills, and serves as an outlet, not merely for the lowlands to the east of them, but also for those to the west. The canalising of the Thames and the Kennet has made them important waterways.

The south coast has many good harbours, such as Southampton Water and Portsmouth Harbour, but the line of chalk Downs which flanks it prevents ready communication with the interior, whilst the Kennet and the Thames form the natural route to the sea. The south-western harbours at Plymouth Sound and Falmouth Bay are excellent, but have little land behind them, while most of what there is is relatively unproductive upland.

Many of these physical hindrances to communication have been overcome by engineers in the last half-century, and now the railways follow not merely the lowlands that we have mentioned, but travel over the hills through passes like that of Shap, or tunnel through the oolitic and chalk scarps of central and southern England.

In Ireland the mountains lie, as a rule, round the coast, thus leaving a great central plain. This central plain is drained mainly by the Shannon, a navigable river expanding into great lakes, and forming a wide estuary, which, unfortunately for Ireland, opens to the west and not to the east. In the south, west, and north there are many good harbours, but they are in the more hilly regions, have relatively difficult communication with the interior, and do not face Great Britain. The southern and northern ports, however, are more favoured in this way than the

western, as the ports in the south communicate with the south-west of England and the Continent, and those in the north with the west of the Scottish Lowlands. The most important openings are Waterford and Cork Harbours in the south, and Lough Foyle in the north. The east coast has few good natural harbours, that of Belfast Lough being the best. Dublin, at the mouth of the Liffey, is on a gentle incurve of the coast, but Dublin Bay is not naturally a good harbour, and engineering works have been necessary to form the harbours at Dublin and Kingstown. Even now vessels of the largest size cannot get up to Dublin.

Climate and Vegetation.—‘All flesh is grass,’ says the preacher, and all animals ultimately depend on plants for their subsistence. Plants alone have the power of obtaining food from the simpler elements found in the air, water, and soil. This they can do only in the light, and when there are sufficient heat and moisture. Their distribution thus depends on that of sunshine, heat, and moisture; in other words, on climate. The nature of the soil and drainage must also be taken into account, but where the climate is unfavourable good soil and drainage do not avail.

In spite of their situation in the northern part of the north hemisphere, between latitudes 50° and 60° N., the British Isles are specially favoured as regards climate. They lie to the north-west of the continent of Europe, and rise above the waters in the north-east of the Atlantic Ocean. Land near a great ocean has a more equable climate than that remote from the sea, and if the prevalent winds blow from the warmer parts of the ocean, as in the case of the British Isles, such a

country has an exceptionally equable and mild climate. Our land is therefore better suited to the growth of plants than most other lands in similar latitudes. The prevalent winds come from between south and west at all seasons of the year, and blow over stretches of warm Atlantic water. When they reach our shores they are heavily laden with moisture, most of which is visible in the form of clouds. The western mountains deflect the clouds upwards, leading to cooling and condensation. This makes them still denser, and causes heavy rains along the western coast and the west of the higher lands. On the other side of the mountains the air begins to descend again, becoming warmer and drier as it sinks once more to the sea-level. On the whole, therefore, the mountainous parts, more particularly their western slopes, are cloudy and rainy; the plains, more particularly in the east, are clear and dry. This has a very important effect on the nature of the plants grown, which in the west are species thriving best in dull, rainy conditions, and in the east those which require a relatively dry, clear climate.

In dull, wet regions plants run to leaf; their fruits mature more readily under drier and sunnier conditions.

From an economic point of view, the fundamental difference between west and east is that in the west those economic plants flourish whose leaves are of most use (and of these grass is by far the most important), and in the east cereals and fruits ripen well. The grass-lands of the country are found in the west and in the uplands, the grain and fruit regions in the plains, more particularly on the eastern side of the mountains.

Temperature, however, as well as humidity, must

be taken into account. For every additional 300 feet in altitude the temperature falls on an average 1° F.; for every additional degree of latitude it falls a little more than 0.5° F.; so that in the higher lands and in the north the conditions are less favourable for plant growth than in the plains and in the south. The temperature of winter is less important than that of summer, for grains and fruits require warm, sunny weather to ripen them, while many seeds and trees can withstand hard frosts. Moreover, many seeds are not sown until the winter is over.

The winter temperature of the British Isles varies little from north to south, but diminishes from west to east. Hence grass grows at all times of the year in the lower parts of the western section of the country, whereas in the east and in the higher lands the cold winters interrupt its growth.

The east is warmer in summer than the west, because it is less influenced by the cooling action of the sea, and the temperature is higher in the south than in the north; so that in summer the south-east is the warmest and the north-west is the coolest part of the British Isles. The dry, warm lands of the south-east are those that favour the ripening of the cereals. Above a certain height the summers are too cold for this to take place, even where the rainfall is suitable. Hence the highest parts of the British Isles are either bare or covered with poor grass, heather, or bracken; or, in the western parts, where the water accumulates in the hollows, great peat-bogs or mosses occur. In Scotland more than three-quarters of the land is unproductive, but in the south of Great Britain and in Ireland the proportion of waste land is less than a quarter. Thirty-

six per cent. of the United Kingdom is covered with permanent grass, and 26 per cent. grows cereals and other crops, including grasses under rotation.

Soils.—Soils are formed of decomposed rocks. They may be divided into clays, sands, and loams. Clays consist of very fine particles that are easily pressed together, and so do not let water pass through them easily. Sands are very different; their particles are larger and looser, and water easily percolates through them. Loam is a mixture of clay and sand in almost equal parts, and may contain more or less organic matter. The organic matter in soils is known as humus, and is of very great importance, its presence making soils fertile.

Lime is found in most soils in greater or smaller quantities, and is very useful when not too abundant. A very limy soil may contain as much as 20 per cent. A clay with a fairly large proportion of lime is called marl.

Soils depend in the first place on the nature of the rocks from which they are decomposed. Soils formed from immediately underlying rocks in the place where they are found are by no means the commonest in the British Isles. They occur mainly south of the Thames, where chalk and flints enter so largely into their composition that they are not very fertile. Many of the limy soils, like those of the Downs and the chalk and oolitic scarps, produce excellent grasses, which form food for many sheep.

Most of the soils of the British Isles are mixed, as the greater part of the archipelago has been covered by glacial drift. The ice, passing over many kinds of rocks, has ground up the waste of these together

to form boulder clay. There is a very noticeable difference in the fertility of the soils north and south of the Thames, the former being one of the richest agricultural soils in the British Isles, because of the mixing brought about by the ice in a region where very many different kinds of rock are found close together. The open clays, which form good wheat-land are mixed soils.

Rivers, passing, as they do, through many different kinds of rock, bring down rock-waste of different composition and a large amount of vegetable débris. This makes the river alluvium, which is a very fertile soil, and much of the Fenland and the valleys of the Yorkshire Ouse and the lower Trent is formed of it. Alluvium occurs in the flood plains, and borders the estuaries of all great rivers.

There is considerable difference in the fertility of the soils derived from the older rocks. Many of the volcanic soils are fertile, but the hard crystalline rocks of the western mountains yield a comparatively poor soil. On the other hand, the Old Red Sandstone and many Carboniferous rocks yield fertile soils, but the limestone which covers so much of Ireland is not a specially favourable one for agriculture.

CHAPTER II.

THE BIOLOGICAL CONDITIONS OF BRITAIN.

Grass-lands.—Where the elevation is over 1000 feet or the rainfall more than 40 inches a year, the land is almost entirely covered with grass, unless

special conditions of temperature or soil make it waste land. This grass-land includes all the mountain area of the western parts of the British Isles. In these districts, as a rule, the grass forms permanent pasture and is little broken up for cultivation, although here and there a patch of ground is sown with oats, and in Ireland considerable areas are planted with potatoes. In the other parts of the islands grass is found either as meadow-land or coming in rotation with other crops. Much of the cultivated grass is used for hay, but the proportion of this is less in Scotland, where the summer is cooler and more rainy than in other parts of the kingdom.

In Ireland 55 per cent. of the land is covered with permanent pasture, whereas in Great Britain the proportion of permanent pasture is less than 30 per cent. (Scotland, 7 per cent.; Wales, 40 per cent.; England, 40 per cent.).

Cultivated Lands.—The drier and lower lands in the east, more particularly of Great Britain, are cultivated. In Ireland $18\frac{1}{2}$ per cent. of land is arable, in Scotland 18 per cent., in Wales 19 per cent., and in England nearly 36 per cent.

Of this land the greater part is cultivated with a rotation of crops—cereals, roots, and grasses—of which cereals are the most important, except in Ireland and Scotland, where only 36 per cent. of the arable land produces cereals, compared with 45 per cent. in Wales and 50 per cent. in England. The principal cereal crop in the British Isles is oats. Two-fifths of the cereal-land of Great Britain and four-fifths of that of Ireland is sown with this grain. The oat flourishes in the cold, moist summer of the northern and western

parts of the kingdom, and the limit of its successful cultivation is fixed by the limit of early autumn frosts, which in the far north, or at a considerable height above the sea-level, kill the plant before the grain has matured. Only in England is less than half the cereal-land covered with oats.

Wheat is the most important English cereal, about two-fifths of the arable land being sown with it. One-third of the land producing cereals in Great Britain is sown with wheat, but only one-twentieth of that of Ireland and of Scotland, and nearly three-twentieths of that of Wales. Wheat requires a warm, dry summer, and the climate of south-east England and its rich soil are specially suited for raising heavy crops. Much of the wheat grown here is winter wheat—that is, wheat sown before winter; and although this is one of the colder regions of the British Isles, the wheat-plant is hardy enough to stand the winter temperature. Wheat-growing on an extensive scale is restricted to the south-east of England, not because the other parts of the kingdom are colder in winter, but because they are colder, wetter, and more cloudy in summer.

Barley, the most widely distributed of all grains grown by man, requires less sun than wheat, and many varieties have the advantage of ripening a week or two sooner after sowing than the oat, so that they can be reaped before the autumn frosts appear. More than a quarter of the land producing cereals in Great Britain, and about one-tenth of that in Ireland, is sown with barley. The wheat-growing area of England is also the region where most barley is produced. The barley of this region is exceptionally well suited for

brewing, and is cultivated for industrial rather than food purposes.

Little rye is cultivated in the British Isles, and that mainly as a green food, though some is allowed to ripen for its valuable straw.

Great changes have taken place in the last half-century in the cereal-producing areas of the British Isles, and in the nature of the crops sown. In Great Britain the cereal-land has been reduced by one-twelfth in twenty years, and in Ireland by one-fourth. Formerly half the cereal-land in England was sown with wheat and only one-fifth with oats, whereas now two-fifths are wheat and nearly one-third oats. In Great Britain over 40 per cent. of the cereal-land used to be wheat-land and 30 per cent. oat-land; now the figures are reversed. The proportion of barley has remained almost constant. In Ireland only 5 per cent., instead of over 10 per cent., is wheat-land. The area of cultivated and permanent grass has grown correspondingly, having increased by 50 per cent. in Great Britain in twenty years. This is largely owing to the cheapness with which cereals can be imported from all parts of the world by the numerous quick steamer services which have grown so rapidly in the past half-century.

After cereals the green or root crops are the most important cultivated plants of the British Isles. The potato, introduced from America, and the turnip, grown as a field-crop since the end of the seventeenth century, are important food-stuffs. Potatoes, turnips, and mangolds are sown on an area about two-thirds that of the corn-lands in England, two-sevenths in Wales, one-half in Scotland, and three-quarters in Ireland.

Potatoes flourish in the moister west, and are by far the most important crop grown in the west of Ireland. Sixty per cent. of the land producing root and green crops yields potatoes in Ireland, but only 16 per cent. in Great Britain. In the west of Great Britain the proportion of potatoes to cereals is also greater than in the east. East Lothian and Fife, in Scotland, however, are both noted for potatoes which are largely in demand in restaurants owing to the skins not breaking on reheating.

Turnips are of special importance in the sheep and cattle rearing regions, where the animals are fed on them in winter. They are abundantly cultivated in all counties of England outside the corn area. About 10 per cent. of such counties as Norfolk, East Riding of Yorkshire, Berwickshire, and East Lothian are sown with turnips every year. The production of the mangold is chiefly carried on in England, and the area is gradually increasing.

Of the industrial plants, flax and hops are the most important. Flax is grown extensively only in Ulster, but over 10 per cent. of the surface of all the counties of this province, except Donegal, Fermanagh, and Cavan, is sown with it. A little is sown in one or two Scottish counties.

The production of hops is practically confined to the counties in the south of England—Kent, Surrey, Sussex, Hants, Hereford, and Worcester.

The cultivation of fruits on a considerable scale is confined to the south-east of England and the Severn Valley, but many small orchards and fruit-farms exist in favoured localities throughout the British Islands, especially in the east.

Market-gardens abound round the large cities, more particularly near London and in the Channel and Scilly Islands.

Woods.—5 per cent. of England and Scotland, 4 per cent. of Wales, and $1\frac{1}{2}$ per cent. of Ireland is covered with forests. In England, Kent, Surrey, Sussex, Hants, and Monmouth are the only counties with more than 10 per cent. of their surface wooded; and in Scotland, Kincardine, Aberdeen, Elgin, and Nairn are the regions with the densest plantations—all these counties except Aberdeen having more than 10 per cent. of their surface wooded. It will be seen that the densest woods exist in the driest hill regions of the islands.

Deciduous trees, such as the oak, beech, elm, ash, alder, and maple, are commonest in the plains and fertile lands. In the northern and higher regions these give place to pine-trees. Many mixed woods of deciduous and coniferous trees exist, especially in the valleys of the mountainous regions.

Useful Animals.*—Cattle.—The distribution of animals is largely determined by the distribution of grass-lands. The rich meadow grass of Ireland and the western part of England is especially suitable for cattle. The proportion of cattle in Ireland is twenty-two to the hundred acres, and in England and Wales about fifteen, while in Scotland it is only six. In England and Wales cattle are most numerous in Anglesey, Cheshire, Leicester, Pembroke, Cornwall, Derby, Somerset, and Staffordshire, and in most of the Welsh counties except Brecon and Merioneth. In all

* Much of the information in this section is obtained from Dr Fream's admirable *Elements of Agriculture* (6th ed.; London, 1897).

the counties named there are over twenty cattle to the hundred acres. In Scotland, in no county are cattle so numerous. The majority are found in western counties like Renfrew and Wigtown, where the grass is rich and the winter mild, or in the Lothians, Fife, and Aberdeen, where they are fattened for the market. Galway, Mayo, and King's County are the only Irish counties with less than twenty cattle per hundred acres; while Limerick, Meath, and Dublin have over thirty.

There are over a dozen native breeds of cattle in the British Isles. Of these by far the most important is the Shorthorn, which, originating in the Tees district of Durham at the end of last century, has spread all over the country, and is also widely distributed abroad. It is a breed noted for its beef and milk, and easily adapts itself to different climatic conditions.

Dairy cattle are found principally on the low lands, where rich meadow grass is obtainable. The Short-horn, the Longhorn of the Midlands of England, the Red or East Anglian polled cows, those of South Devon and of Kerry in Ireland, are among the chief breeds; but, above all, the cows of Ayrshire, in Scotland, and of Jersey, Guernsey, and Alderney, are famous as milk producers.

The large cattle which are reared for their beef belong to the Shorthorn breed, found in all parts, or to the Hereford, Sussex, Welsh, Galloway, or Aberdeen breeds, whose distribution is indicated by their names.

Some breeds, such as the Shorthorn, the East Anglian, the Devon, the Welsh, and the Dexter Kerry, are reared both for meat and for milk.

The Highland cattle are a small but very hardy

breed, living on the poor pasture of the Scottish mountains, and, like the larger Galloways, yielding good beef.

Many of the cattle reared for the butcher are stall-fed, and feeding-stuffs of many kinds, some imported, are used.

Cows that are used for dairying have to be treated differently to cattle fattened for the market. To produce milk rich in fats, which are necessary both for butter and cheese making, a richer diet is essential, as cows that feed on poor pasture yield milk which is small in quantity and poor in quality. Dairy cows require much more careful attention than cattle reared for the butcher.

Sheep.—Broadly speaking, sheep are found chiefly in regions where cattle are few. They are commoner in the drier east than in the rainier west. They are found on the hillsides rather than on the plains. The chalk Downs of England and the Southern Uplands of Scotland are the best sheep-regions ; but large numbers feed on the steep and easily-drained hillsides of the west, where they are reared principally for their mutton, whereas those on the eastern heights are bred largely for their wool as well as for their flesh. In England over fifty, in Wales over sixty-five, in Scotland thirty-eight, and in Ireland twenty-two sheep are found to the hundred acres. There are more sheep per hundred acres in Roxburgh, Selkirk, and Berwick than anywhere else in the kingdom. In Kent, Romney Marsh and the Downs are both suitable for sheep rearing, and one sheep is found to every acre. In all the counties through which the Downs extend the proportion of sheep is considerable. Cumberland, Westmor-

land, Dorset, Devon, and Cornwall, and most of the Welsh counties except Pembroke, Anglesey, Carmarthen, and Flint, have more than fifty sheep to the hundred acres. In Scotland all the southern counties, as well as the south-west of the Highlands, are noted for their sheep. In Ireland, Connaught and Leinster have many more sheep than either Ulster or Munster; Carlow, Wicklow, and Galway being the counties which have over forty sheep per hundred acres.

The mountain sheep, such as the blackfaced and the Cheviot sheep of Scotland and the Welsh mountain sheep, are usually horned, and as a rule have rough fleeces, with thick, strong wool. They yield mutton of very fine quality. Except these, together with the Border Leicesters of the south of Scotland and the Roscommon breed of Ireland, all the other varieties of sheep are English. Of these, the most important are the long-woolled Cotswolds, Leicesters, and Lincolns, and the short-woolled sheep of the Downs and Shropshire. The pure Leicester is largely used for crossing with other sheep, especially those fattened for the market. The Southdown sheep, with fine short wool, has been used for crossing with, and thus improving the breed of many short-woolled sheep, some of which now form distinct varieties, like the Oxford Downs.

There are many varieties of sheep confined to limited regions, such as those of Romney Marsh, the Exmoor sheep, the Wensleydale, the Limestone breed of Westmorland, and others.

Horses are largely found in the drier parts of the British Isles, on less hilly ground than the sheep. In England, the East Riding of Yorkshire, Norfolk, Cambridge, and Huntingdon have more than five

horses per hundred acres; and in Ireland, Down, Wexford, and Louth have the same number, and Dublin has double. In Scotland most horses are reared in Fife and Linlithgow; but the proportion is only about three per hundred acres.

There are two types of horses—the heavy work-horses, of which the Shire, the Clydesdale, and the Suffolk are the different breeds; and light horses, such as the thoroughbred, the hackney, the Yorkshire carriage-horse, and the small ponies which are found in the less accessible, less fertile, and more rugged parts of the island, such as the Shetland Islands, the Highlands of Scotland, the Welsh mountains, Dartmoor and Exmoor, and the New Forest. The Yorkshire coach-horse is bred in the north-eastern counties, more particularly in the North and East Ridings of Yorkshire itself. The hunter and thoroughbred are reared in different parts of England and in Ireland. The hackney or nag is reared chiefly in the eastern counties, more particularly in Norfolk, Cambridge, Huntingdon, Lincoln, and Yorkshire. The Shire is the largest work-horse, and is reared mainly in and around the Fenlands. The slightly smaller and more graceful Clydesdale is bred in the region which gives it its name. The Suffolk horse is still smaller in size, but is long-lived and a good worker.

Pigs.—The proportion of pigs to cattle is greatest in the south-east of Ireland and England; but the largest number per acre is found in such eastern counties as Suffolk, Essex, Middlesex, Bedford, Cambridge, Huntingdon, and such western ones as Flint, Cheshire, Anglesey, Somerset, Dorset, and Cornwall. The total number in England is over five, and in

Wales under five, per hundred acres. In Scotland, most pigs are reared in Clackmannan, Wigtown, and Midlothian; but they are comparatively few. On the other hand, in Ireland most counties rear more than six pigs per hundred acres; the proportion being least in Connaught and greatest in Wexford.

Most pigs in Britain are white in colour, and are distinguished as Large, Middle, or Small White breeds. There are two black breeds, known as the Small Black of Suffolk and Essex and the Berkshire breed; while the Tamworth sow, originating in Staffordshire, is red.

The Large White sows yield a great proportion of lean meat and can be grown to enormous weights, whereas the Small White sow usually makes very fat bacon.

The British Farmer and his Competitors.—In spite of the large quantities of farm produce of every kind grown in the British Isles, the supply is wholly inadequate to the consumption of the country, and cereals, vegetables, meat, and dairy produce of all kinds are imported in ever-growing quantities. While the yield of English wheat crops per acre is higher than that of any other country in the world, except that of the small wheat-producing area of Scotland, the British farmer has found it difficult to compete with the settler who has cultivated the virgin lands of America or the rich black soil of Central and Southern Russia. He labours under the disadvantage of cultivating a soil which requires heavy manuring and careful tillage to produce good crops, while the high rent paid for land and the cost of transport by rail more than counterbalance the advantages due to the proximity of his markets. Rent and freight charges

will undoubtedly be reduced ; but even then the British farmer will find the best guarantee for success in even more skilled farming than that for which he is already famous. Agriculture involves great scientific knowledge as well as practical skill ; and in the matter of agricultural education our country has been comparatively backward compared with the United States, Denmark, and some of our colonies. With a more careful and intensive use of the natural agents of the country, the quantity and quality of pastoral and agricultural products may be still further improved ; and in the future agriculture will probably become much more important than it is even at the present day.

Fisheries.—Fishing is a great source of food-supply. In this country fresh-water fish are comparatively unimportant. The salmon and sea-trout, which migrate between salt and fresh water, are caught in the rivers, mainly in the estuaries of Scotland, western England, and Ireland, more particularly in the Spey, Tay, Tweed, Severn, Bann, and Shannon.

The sea fisheries are exceedingly valuable. The turbot, sole, flounder, and other flat fish ; the cod, haddock, herring, mackerel, and pilchard, are the most important fish caught. The waters over the shallow banks of the North Sea, and round the islands in the north and west of Britain, are visited by fishermen from many ports. From every little fishing village men fish with hand-lines, catch shellfish in traps, and go out in fishing-boats to the adjacent fishing-ground, where both lines and nets are used. The great centres of population are supplied with fish from the fishing-ports, which send out fleets of sailing and steam trawlers and other fishing-vessels, some of which have

tanks where fish can be kept alive until the ship returns to port. The fish may be sent from the fishing-grounds in swift carrier steamers direct to London or to the nearest port, whence they are despatched by special fast trains to the great cities. The east coast fisheries are the most valuable, and three-quarters of the fish are landed in England at east coast ports.

Fish are caught by hooks or in nets, which are either fixed or hauled. Short lines, whose hooks are rebaited after each fish is caught, are used close to the shore all round the coast. The east and south coast fishermen send out very long lines (some even eight miles in length, in eastern England), to which hundreds of baited hooks are attached. These are sunk across the current to let the short lines, to which the hooks are attached, float clear of the long one. When hauled in, haddock (in Scotland), cod (in the east of England), cod, ling, conger, skate (in the south of England), and many other predaceous fish are caught. The Scottish fishermen use mussels for bait, those in southern England squids or cuttlefish.

Where the bottom is smooth a trawl is used. It consists of a netted bag, with finer meshes near its end, the mouth of which is fixed to a beam raised a little above the bottom. This is hauled along, and brings up flat-fish such as flounders, soles, plaice, halibut, turbot, and others, together with fish that feed at the bottom of the sea, like cod, haddock, hake, and ling. The trawls are sometimes carried by large sailing-vessels, but oftener by steamers. From Aberdeen, Leith, and Granton, trawlers go eastwards to the banks in the North Sea. In eastern England, Hull, Grimsby, Yarmouth, Lowestoft, and Ramsgate send

trawlers to the Dogger Bank in winter and to the east of the North Sea in summer, whence the fish are sent to these ports or to London by fast steamers. On the south coast, Brixham and Plymouth are the chief trawling stations, the boats going as far in summer as the north coasts of Cornwall, where east coast boats also come. In the Irish Sea, Cardiff tugs often trawl off Lundy Island, and regular trawlers leave the Lancashire ports of Liverpool, Southport, Blackpool, and Fleetwood, especially for the seas round the Isle of Man, to which Whitehaven and Dublin send trawlers, as well as Douglas.

Migratory fish, such as the herring, mackerel, and pilchard, are caught in nets. Drift-nets are sunk across a current, and the heads of the fish are entangled in the meshes, which vary in size according to that of the fish to be caught. The herring is much the most important. It is caught chiefly off the Scottish coast in the west early in the year; in the north in summer; farther and farther south, along the east coast of Britain, as the year advances; and in the English Channel in winter. The ports of the Clyde sea-area, Strome Ferry, Stornoway, Lerwick, Wick, Fraserburgh, Peterhead, Aberdeen, and the Forth ports are the chief Scottish centres of the herring-fishing; and the north-east of England ports, especially Whitby, and Yarmouth farther south, are the chief English centres. Off the south coasts of England and Ireland mackerel-fishing is very important. Pilchard-fishing is confined to the south-west of England. The pilchards are caught in nets, which are let down across a bay such as that of St Ives in Cornwall, and hauled to land by ropes. Sometimes so many fish are trapped

that a number of smaller nets have to be used inside the barrier formed by the big one, which would break with the pressure of the fish were it drawn ashore.

Many 'shellfish,' such as lobsters, crabs, shrimps, and other crustaceans, are caught in traps or netted, and oysters and other molluscs are dredged.

The same number of men—over 40,000—are engaged in fishing in Scotland and in England, but the value of the English is three times that of the Scottish fisheries, mainly owing to the nearness of large markets. In Scotland more than ten men, and in Ireland about five men, in every thousand are fishermen. In England and Wales the proportion is rather more than one man per thousand.

CHAPTER III.

DISTRIBUTION OF MINERALS AND MINING CENTRES.

THE mineral wealth of the British Isles is mainly in the older rocks of the west and north. In the newer rocks of the south-east, clay (for making bricks), lime, and chalk are the most important mineral products.

The older rocks yield valuable minerals, and most of the sandstones and limestones can be used for building purposes.

Building Materials.—Of the building stones, the most important are the sandstones of Carboniferous and Permian times; but the oolitic limestones are also used for building purposes. The granite rocks of Aberdeenshire, Galloway, and Galway are quarried for stones

suitable for massive structures, such as bridges and reservoirs, where great strength is required, and for ornamental stones to be used in public buildings. Marble is quarried in Ireland.

Carboniferous limestones, as well as those of more recent date, are burned to yield lime, which is used as mortar or as a purifier or a fertiliser. Portland stone is ground to form an exceptionally quick-setting mortar known by the name of Portland cement.

In many parts of the older regions of the British Isles local stone is used for building purposes, whereas in the south-east of Great Britain nearly all the houses are built of brick. The hard old red sandstones of Caithness can be cut into large, flat, thin slabs which form excellent pavement.

Slates for roofing purposes are formed of rocks which are easily split into thin layers. These are usually clays which have been subjected to great heat and pressure. Purple slates are found in Wales, more particularly round Llanberis and Festiniog. The green slates of Tilberthwaite in Cumberland are the most beautiful of all; and different blue, gray, and purple slates are found in various parts of Scotland, more particularly in Perthshire and Argyllshire (at Easdale and Ballachulish), and in Ireland (in Cork and Tipperary).

Some Carboniferous rocks are useful for making fireclay, more particularly those of 'The Potteries' in North Staffordshire, those round Kilmarnock in Ayrshire, and those in Tyrone. Fine pottery is made in 'The Potteries' and in Worcester, whither kaolin or china-clay, a decomposed granite suitable for making the finest porcelain, is taken from the Cornish peninsula.

Coal.—Coal is the chief mineral mined in the British Isles. Iron and coal are two of the great sources of our industrial prosperity. ‘The rich underground kingdom of the English and Scottish coalfields has often been called the Black Indies.’ As coal is used in reducing the ores of the useful metals, especially iron, we shall study its distribution first.

Coal is found in the Carboniferous rocks, and therefore in the west and centre of Great Britain. The coal-measures are preserved in the rocks which form the trough of the Scottish Lowlands. In England they originally covered the whole of the Pennine heights; but, though they are still found on both flanks, they have been worn away from the summits. They are also found where the Carboniferous rocks bend down on the eastern and south-eastern sides of the Welsh Highlands. In Ireland, which was formerly entirely covered by coal-measures, only a few isolated patches of coal now remain.

Coal-mining is carried on in Ireland at Castlecomer in Kilkenny, and at Dungannon in Tyrone, but is not important. The chief fields in Great Britain are the **Scottish** coalfield, divided into the western or Ayrshire coalfield, the central coalfield in Lanark, Linlithgow, and Stirling, with an outlier in Clackmannan north of the Forth, and the smaller fields of Fife and Midlothian; the **Northumberland** and **Durham** to the north-east, the **Cumberland** to the north-west, the **Yorkshire**, **Derbyshire**, and **Nottinghamshire** to the south-east, the **South Lancashire** and the **North Staffordshire** to the south-west, of the Pennines; the **North Wales**, the **Shropshire** and **Worcestershire**, the **Forest of Dean**, and the **South Wales** coalfields on the borders of the

Welsh mountains; the **Midland** in South Staffordshire, Warwickshire, and the borders of Leicestershire and Derbyshire, and the Bristol, both surrounded by young rocks.

(Those in large type are the most important.)

Coal is usually mined; but in a few places it is simply quarried. Its value has long been known. There is evidence that it was quarried even in Roman times. Sea-coal was sent to London from Newcastle from the thirteenth century onwards. With the clearing of the country and the growing scarcity of timber, the use of charcoal for iron-smelting became too expensive, and in the eighteenth century coal came into general use for this purpose. This gave a great impetus to the extraction of coal. New mines were opened and carried deeper and deeper to meet the ever-increasing demand due to the application of steam-power to machinery. The output has steadily increased, and was never greater than at the present time when over 200,000,000 tons are raised yearly. The Northumberland and Durham field, and the Yorkshire, Derbyshire, and Nottinghamshire field, are the richest, each yielding over 43,500,000 tons in 1897. The South Wales coalfield produced over 34,500,000 tons in the same year, the Scottish coalfields 29,000,000 tons, the Lancashire coalfield 23,000,000 tons, the two Staffordshire coalfields 13,500,000 tons, and the others put together 15,000,000 tons.

The quality varies considerably in the different coalfields. In most it is a soft black coal, producing considerable heat and smoke. The cannel coal of central Scotland was formerly almost exclusively used for making gas, but it is now almost exhausted.

Anthracite from the South Wales coalfield supplies the smokeless coal for our navy, and is the fuel used in breweries.

The coal yielded in the various coalfields is put to very different uses.

In Scotland it is used in the iron and textile manufactories, more particularly in the west, as well as in Fife and southern Scotland. Much is exported from the Forth to the North and the Baltic Seas, to the Mediterranean, and even farther; from the west,



Scottish Coalfields.

chiefly to Belfast and the North of Ireland. The latter region also receives the surplus coal from the Cumberland coalfield, much of whose output, however, is used in smelting iron ores in Furness.

The output of the Northumberland and Durham coalfield is largely used in the iron industry. The surplus is exported, large quantities being shipped to London and all over the world.

The York, Derby, and Nottingham coalfield supplies the woollen manufactories of the West Riding of Yorkshire, the ironworks of Sheffield, and the textile

works of Nottingham. Any surplus is exported to London by rail, or from Goole on the Humber.

The coal of the South Lancashire coalfield is almost entirely used in the local cotton manufactories and



English Coalfields.

engineering and chemical works. It also supplies fuel for steamers sailing from Manchester and Liverpool. Hardly any is available for export.

The North Staffordshire coalfield supplies steam-power in the pottery district.

The Midland coalfield supplies fuel for the Black Country in South Staffordshire, the great centre of the iron manufacture. Large quantities are sent by rail to London.*

The North Wales coal is used locally and in the salt and chemical works of Cheshire.

The Shropshire-Worcestershire coalfield, stretching between Coalbrookdale and Bewdley, supplies the ironworking region of South Staffordshire to the east, the Worcester potteries to the south, and the woollen manufactures at Kidderminster.

The Forest of Dean coalfield provides the coal needed in the local iron smelting and forging.

The Bristol coalfield supplies that city and the West of England woollen manufacturing centres.

South Wales coal is shipped to all parts of the world. Some is used in the district for smelting different ores. Many of these are imported, copper being brought even from distant Chile and red hematite from Spain, as it is less difficult to carry the ores to the coal than the coal to the ores. Anthracite

* 'Of the coal-basins in Great Britain, the Midland coalfields are the least favourably placed for foreign trade. The Scottish basin is encircled and penetrated by the sea. The estuary of the Clyde on one side and the Firth of Forth on the other open it up by their long fjords, and form, as it were, large natural canals. The Durham and Northumberland coalfield stretches in the direction of a coast-line with numerous and excellent ports, among which it will be sufficient to mention Newcastle and Sunderland. The Welsh coalfield is provided for by the long estuary of the Bristol Channel. In the presence of three rivals so well equipped for exportation, the Midland coalfields are quite naturally designed to carry on the home trade.'—Quoted, with slight modification, from *The Labour Question in Britain*, by Paul de Rousiers. Translated by F. L. D. Herbertson. Page 165. London, 1896.

is sent to the great brewing centres, to vessels in the British navy, and to all our naval coaling stations.

Iron.—Iron is by far the most important of the metals obtained in the British Isles. It is found in several forms. In the more recent rocks, pouches of iron exist here and there, and used to be worked before the discovery of the richer deposits in the older rocks. They occurred mainly in the chalk rocks, and the timber of the wooded Weald was used for smelting them. The finest British iron ore is the red hematite of Cumberland and North Lancashire, which is an oxide of iron easily reduced to the pure metal. The brown hematite, not quite so rich in iron, is mined in South Wales, the Forest of Dean, Northamptonshire, and Antrim. Blackband and clayband iron ores, impure carbonates of iron, are common in most of our coalfields, as, for instance, in the Scottish Lowlands. The fact that iron and coal so frequently occur together has had much to do with the rapid development of the manufacture of iron in the British Isles. Another great advantage is that lime, which is used as a flux in smelting, is generally also present in the same region, together with a plentiful supply of fireclay.

Middlesbrough has become the most important iron-smelting centre in Britain since the discovery of a suitable method of obtaining iron from the ironclays, which form much of the Cleveland Hills in north-east Yorkshire. It obtains coal from the Durham and Northumberland field, and limestone is found comparatively near. Magnetic or black iron ore, the finest of all, is imported from Sweden to the ports of Durham and Northumberland, to be smelted mainly

at Middlesbrough, Stockton, Darlington, and the Tyne ports. The Scottish Lowlands are important iron centres. The local blackband and clayband iron ores are supplemented by red hematite from Spain. Glasgow, Airdrie, Coatbridge, Motherwell, and Kilmarnock are the chief centres. Barrow is the great centre for smelting the red hematite of the Furness region, with coal brought from Cumberland, Scotland, or Lancashire. South Wales receives most of the great imports of Spanish iron ores, through Swansea, Cardiff, and Newport, and the smelting is carried on at Newport, Merthyr Tydfil, and other centres. The iron ore of the Midlands is smelted in and around Birmingham, at Wolverhampton, Dudley, Walsall, Wednesbury, and other places, mainly in South Staffordshire. Iron-smelting is important in the West Riding of Yorkshire, especially at Rotherham.

Other Metals.—Traces of the precious metals are found in many parts of the United Kingdom, but rarely in quantities sufficient to pay working expenses.

The Cornish peninsula has long been one of the chief European sources of tin. Copper is also found, but the ore is now almost exhausted. Zinc is mined along with lead in the North of Wales and in Northumberland. Lead, in the form of silver-lead ore, from which both metals are extracted, is also found in the Lead Hills in Scotland, in Cumberland, Northumberland, Wales, the Isle of Man, and the Wicklow Mountains in Ireland.

Peat.—In Ireland, northern Scotland, and other regions where great peat-bogs exist and coalfields are distant, peat is cut and dried for fuel. In Ireland it is even used industrially; and this use of peat will

largely develop with the discovery of a suitable process for turning it into coke.

Oil-shale.—In the midlands of Scotland, more especially in Midlothian, West Lothian, and Fife, large quantities of oil-shale are mined. This oil-shale is a compressed black clay, from which burning and lubricating oils can be distilled and candles and other paraffin products extracted.

Salt.—One of the most useful minerals is salt. On many parts of the coast it is obtained by evaporating sea-water, but great beds of rock-salt exist in the valley of the Weaver in Cheshire (near Northwich), at Droitwich in Worcestershire, and in south-east Durham. From these beds salt is obtained either by mining or by pumping the brine, but principally by the latter process. In addition to its domestic utility, salt is used in Worcester to form a glaze for pottery, and in Cheshire, South Lancashire, and in the north-east of England in various chemical industries.

CHAPTER IV.

DISTRIBUTION OF MANUFACTURES AND MANUFACTURING CENTRES.

Rise of Manufactures.—The manufactures of the British Isles, now so important a branch of national activity, developed but slowly until last century. They grew out of the domestic industries necessary in an early stage of society, when every household was more or less self-supporting. Then, doubtless, every housewife spun wool or flax into yarn, wove the yarn into

cloth, and made the cloth into clothes and napery, while the men provided shelter, weapons, and implements.

One of the first trades to become important was that of the smith. Our Teutonic forefathers deified Thor the Hammerer. Confined in early times to the forging of armour, weapons, and implements, the smith's trade has now become increasingly complex with the extended use of iron in the arts of peace and war, until at the present day engineering is one of our most important occupations.

In the same way the other domestic industries of primitive society have developed into highly-skilled industries carried on by specially-trained workmen. Spinning or weaving now forms the only occupation of thousands of people. The grinding of grain into meal, the baking of flour, and the fermenting of grain have similarly become special trades practised by great bodies of men. The tanning of hides and the making of leather goods are now also special occupations. With the opening up of the country the trades connected with transport of various kinds grew up, developing later into the great railway industries. The ancient Briton made his small canoe in the roughest way; the modern Briton constructs great ships which sail to the uttermost parts of the earth.

Classification.—Manufactures can be classified in several ways, as, for instance, those dealing with the production of food, those having reference to shelter or protection, and those concerned with transport. Another possible classification is according to the nature of the raw material—mineral, vegetable, or animal; still another according to the process of manu-

facture—mechanical, chemical, or biological. For instance, the making of cloth is a mechanical process, the making of dyes a chemical one, and brewing a biological one. No hard-and-fast line, however, can be drawn, for the manufacturer of cloth often dyes it, and the brewer has chemical as well as biological processes to consider. The problem of the manufacturer—to transform some natural product into an artificial one, which will be of greater use than the unworked raw material—is on the whole a simpler one than the brewer's, which is to transform organic materials into their most utilisable form. Here we shall deal first with the mechanical industries connected with clothing, shelter, and protection, such as the textile and iron industries, and then with the chemical and biological ones.

The Textile Industries.

Historical.—The textile or spinning and weaving industries have grown very gradually. Several unsuccessful attempts were made by English kings to introduce them as special industries before the efforts of Edward III., in the fourteenth century, led to the settlement of weavers in East Anglia and elsewhere. The chief centre was round Norwich, more particularly in the village of Worstead, which has given its name to worsted goods. Numerous other manufacturing centres existed over the chalk Downs. The populous and prosperous south-east of England was the chief industrial region until the discovery of coal led to a shifting of the woollen centres.

Woollen and linen manufactures had grown up both in Lancashire and Yorkshire; but these were far

removed from the more densely populated regions. Kendal green was a famous cloth in the Middle Ages. Manchester cottons, probably a mixture of wool and linen, are also mentioned in old works. At the end of the fifteenth century the Yorkshire woollen manufacture was stimulated by the settlement of a large number of Flemish weavers. With the application of coal to industry, those manufacturing centres which were favourably situated for obtaining wool and coal, and were well supplied with water for scouring and dyeing, grew at the expense of the others. The once great woollen manufacture of Norwich declined because neither coal nor water-power was available.

Sources of Power.—During the past century steam has been the chief source of power used in industry. To-day the use of electricity is becoming more and more common, steam being used to generate it. Attempts are being made to cheapen its production by utilising wind and water power (forces which at present are but little used) for this purpose; and probably these two sources of power, as well as the tides, will be more and more utilised in the twentieth century. This may lead to a considerable rearrangement of the industrial centres, which would tend to develop in regions with abundant water-power—that is, in the mountainous parts of the country—and more particularly near the coast, where water transport is available for obtaining raw material and distributing manufactured goods.

The Manufacture of Woollens.—Before the arts of spinning and weaving were discovered, men probably pounded the wool fibres together into a felt. Before

wool is manufactured at the present day it is first of all cleaned and scoured in pure soft water, such as that of the streams of the Southern Uplands of Scotland, where there is no limestone. A little alkali is added to the water to remove the natural grease in the wool. The wool is next teased to separate the fibres, and oiled to keep them from snapping in the course of carding and spinning. Carding is the process of separating each fibre of the wool, after which a number are condensed together and then spun or twisted round and round into yarn. The yarn is next woven into cloth. A series of parallel threads of yarn are fixed to form a warp, and another thread is made to cross this warp at right angles (under some threads, above others), forming the weft of the cloth. The cloth is then scoured to clean and soften it, and milled or felted to make it more compact. The old way of felting or fulling was to soap the cloth, and then beat it with big hammers; but it is now milled in a machine. The felting property, which is peculiar to wool and hair, makes woollen cloth denser and more compact than that made from vegetable fibres. Dyeing may be done at any stage of manufacture, most commonly after the wool is scoured or the yarn spun; but for some purposes the material is not dyed until after the cloth is woven.

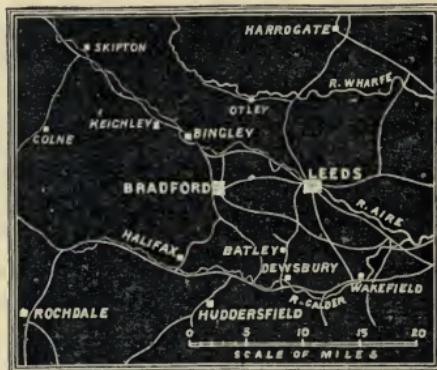
Woollen Manufacturing Centres.—Although all the wool produced in this country is not manufactured in it, and considerable quantities are exported to other woollen manufacturing centres on the Continent, the home supply of wool does not suffice for the woollen manufactories. Much is brought from Australia, South Africa, and other countries; and manufacturing

centres near good ports have an advantage over others, especially if they are also near a good coal and water supply. At the present time the woollen manufacture is carried on in three chief centres—in Yorkshire, the west of England, and the Tweed valley.

The **Yorkshire woollen centre** is exceptionally favourably situated as regards the easy supply of raw material and the distribution of the manufactured articles. It lies half-way between the Irish and the North Seas, with the great ports of Liverpool on the west and Hull on the east. The hills of Yorkshire afford pasture for innumerable sheep, its coalfield is of almost inexhaustible richness, and it is excellently watered. The chief centre of the woollen manufacture is Leeds, on the Aire. Many other large towns have grown up, such as Bradford, and the towns in the Calder valley—Halifax, Huddersfield, and Dewsbury.

The **West of England woollen centre** has also its port, Bristol; the coalfields of Bristol and the Forest of Dean are near; and numerous streams drain the Cotswolds. Stroud in Gloucestershire, and Bradford in Wiltshire, are the most important centres. The scarlet cloth for uniforms is manufactured at Stroud.

The **South of Scotland woollen centre** also combines the same advantages—uplands for pasture, mountain rills and streams, and accessible coalfields. Peebles,



Woollen District.

Galashiels, Selkirk, Hawick, and Jedburgh on the Tweed and its tributaries, Langholm on the Esk, and Dumfries on the Nith are the chief manufacturing towns. They manufacture cheviots and tweeds (the former so named from the hills where the sheep feed).

Outside these three centres the chief woollen manufacturing towns are Bury and Rochdale, both near Yorkshire, which combine woollen and cotton manufactures. Some woollen manufacture is carried on on a small scale in many towns both in Great Britain and Ireland, more particularly where wool is plentiful. Flannels are made at Welshpool and other towns in the upper valley of the Severn, which are near the West Shropshire coalfield. Witney in Oxfordshire is noted for blankets. Kidderminster and Wilton make carpets. Leicester hosiery has long been famous. Hand-loom weaving has not quite disappeared, and the strongest cloth made in the British Isles is probably the Harris tweed, manufactured in this way in the Outer Hebrides.

The Manufacture of Linens.—Linen thread and cloth are made from the fibres of the flax-plant. The plants are uprooted as the seeds ripen, and these are taken off or 'rippled' to make linseed oil and cake. The fibres are separated from each other by allowing the stem to rot or partially rot—that is, ferment—either in soft water or simply on wet grass. They are next dried, and then broken, which permits the removal of the woody parts. This process is called 'scutching.' The fibres are combed or 'heckled,' and the long fibres, or 'line,' separated from the short fibres, or 'tow,' and the line is prepared for spinning, the next process it undergoes. Successful spinning requires a certain humidity of the air, and the finer linen threads are spun when quite wet. The linen yarn is finally woven into cloth.

Linen Manufacturing Centres.—Historically the manufacture of linen is next in importance to that of

wool; flax, like wool, being a home product. In the time of Charles I., Wentworth introduced the cultivation of flax into the north-east of Ireland, which is the principal seat of the production of lint and linen at the present day. Although Ulster has no coal, except at Dungannon, it is conveniently situated opposite the Ayrshire and Cumberland coalfields, whence cheap supplies can be procured. The water of Ulster is very suitable for bleaching linen, which is the chief manufacture of Ireland. Belfast is by far the most important centre, making all kinds of linen goods, but especially the finer sorts. Lisburn, Lurgan, and most of the towns of Ulster manufacture lawn, cambric, and fine linen. Outside Ireland linen is spun and woven principally in Fife, where Dunfermline, the chief centre, is noted for its table-linen. At Kirkcaldy coarser linens are made; and in Forfarshire—at Dundee, Brechin, and Arbroath—still coarser goods, such as canvas and sailcloth, are woven. Fife possesses several special advantages. Flax is imported from the Baltic, which lies opposite to Fife; and coal is obtained from the Fife and Clackmannan coalfields. The constancy of the temperature and of the humidity of the air are favourable climatic conditions. Barnsley, the only important centre in England, lies in Yorkshire, east of the Pennines, and, like Kirkcaldy, makes upholstery linen.

The Manufacture of Cotton.—Raw cotton consists of the fibrous hairs surrounding the seeds of the cotton-plant, which belongs to the mallow and hollyhock family. It flourishes between the tropics, but is now grown in favourable places in the warmer parts of the temperate regions. The fine white hairs are

separated from the cotton seeds by a machine called the gin. The seeds, like those of the flax-plant, yield oil and form a food-stuff for animals, while the stalks are made into paper. The 'cotton-wool' is carded, drawn, and spun into yarn, and then woven into cloth. Little more than a century ago cotton yarn could not be spun strong enough to make the warp, for which linen or wool was used. Nowadays both warp and weft are of cotton, and this pure cotton cloth is called calico. Cotton is also used mixed with linen, with wool, with silk, and other fibres to make different varieties of yarns and cloth.

Cotton Manufacturing Centres.—All raw cotton is imported. Consequently the regions near the great ports have greater facilities for obtaining it than those far inland; and, as most of it comes from America, the west coast ports are more favourably situated than those on the east. Bristol, Liverpool, and Glasgow, the three great ports of communication with America, are respectively connected with the three great western coalfields of Scotland, Lancashire, and South Wales. The climate and waters of Lancashire and Scotland are specially favourable for the cotton manufacture, which requires a fairly damp atmosphere for successful spinning and weaving. A great development of the cotton manufacture has occurred in the past century. Formerly cotton was mixed with other fibres; but since the introduction of steam-driven machinery the manufacture of pure cotton goods has developed until it is now the most important industry of the country. A century ago the cotton manufactured was worth little more than one-twentieth of the woollen; but at the present day it is worth double, while the value

of the linen manufactured is only one-fifth that of the cotton. By far the greatest proportion is manufactured in South Lancashire, in the towns surrounding Manchester, such as Stockport (which, however, is in Cheshire), Ashton, and Stalybridge;* Oldham, Rochdale, Bury, and Bolton; and in the towns on the north of the Lancashire coalfield, Burnley, Accrington, Blackburn, and Preston. Manchester manufactures little, but is the great market and distributing centre.



Cotton District.

In Scotland cotton is manufactured—chiefly into cotton thread—at Paisley.

Most machine-made lace is composed of cotton threads, for the linen threads of which the beautiful, delicate hand-made lace is formed are too fine for machinery to manipulate. Nottingham is the chief centre of cotton-lace and net manufacture.

Cotton, Woollen, and Linen Manufactures.—A century ago the value of cotton, woollen, and linen yarns and piece goods produced in Great Britain and Ireland was about £22,000,000—say,

* Stalybridge is partly in Lancashire, but principally in Cheshire.

woollen, £17,000,000 ; linen, £4,000,000 ; and cotton, £1,000,000. Of recent years the value has been about £170,000,000—say, cotton, £100,000,000 ; woollen, £50,000,000 ; and linen, £20,000,000. The total amount of capital employed is about £200,000,000 ; and at least 5,000,000 people—men, women, and children—are dependent upon these textile industries for their livelihood. Moreover, one-half of the value of British and Irish products exported consists of textiles.*

Jute and Hemp Manufactures.—Jute is a plant of the lime-tree order, which flourishes in hot, moist climates, in regions with rich soil, such as the Ganges delta. It grows five, ten, and even more feet high, and the fibre is separated by rotting, like linen from the flax-stems. The manufacture of yarn and cloth is carried on very much like that of linen, but all the fibres are carded. Jute is a long, strong, silky fibre, and the finer tissues assume a silky appearance. Unfortunately it is difficult to dye in fast colours. Jute carpets, curtains, handkerchiefs, and fabrics may be made ; but the staple jute product is coarse sacking for bags. The manufacture of jute is almost entirely confined to Dundee, Arbroath, and Montrose, all in Forfarshire.

In these towns hemp is also spun, and rope-making is carried on all round the coast, as every seaport requires it. Hemp is grown in most European and many other countries ; but our supply comes largely from Russia, especially from Poland. New Zealand hemp and the Manila hemp are strong fibres derived from quite different plants.

Silk Manufacture.—Silk, like wool, is a fibre of animal origin. It is secreted as a fine thread by the caterpillar or larva developed from the egg of a moth.

* Thomas Ellison in the *Statesman's Year Book*, 1899.

This silk thread forms a cocoon, within which the larva passes a quiescent stage of its life; then it dissolves part of the silk cocoon, and emerges as a moth again. The silk-rearer heats the finished cocoon, and thus kills the larva. He then softens with hot water the gum binding the silk threads, and unwinds and reels up three or four or more of the fine fibres together as one thread, known as raw silk. This is cleaned and twisted into thread and woven; but sometimes the raw silk itself is used for the warp. Spitalfields, in London, was long famous for silk-weaving; but few looms are now employed there. The manufacture of silk is scattered up and down the country, the chief centres being Macclesfield, Derby, Coventry, and Leek (threads for needlework), while silk waste is manufactured in Bradford. The raw silk is all imported.

Fibres for Textile Manufactures.—The fibres used in our textile industries are few in number. Flax, cotton, jute, and hemp are of vegetable origin; wool and silk of animal origin. Vegetable fibres, like the ramie or China grass, have been tried. China grass is an exceptionally strong and beautiful fibre, but hitherto the difficulties of preparing it for spinning have prevented its general adoption for cloth-making. Several hundred fibres at least exist which might be used for textile purposes; and it is desirable that systematic experiments should be made to test the value of each of these, samples of which are to be found in the great collection at Kew Gardens.

The Iron Industries.

In the past century iron, and in recent years steel, a specially prepared form of iron, have largely replaced wood as a constructive material. Iron beams and pillars are used as supports in building; iron or steel

is the most common material for bridges; rails are laid with it, and it enters largely into the construction of trucks and of carriages; the locomotives that draw the trains are made of it, and we traverse our roads on steel bicycles. Machinery of all kinds is mainly constructed of steel; our ships are almost entirely built with that metal, and the guns and projectiles of our navy and army are principally composed of iron in some form or other. Less striking, but equally important, is its use in bolts, screws, and rivets, for purposes too numerous to mention.

South Staffordshire has long been a famous centre of the iron manufacture, for the timber of its forests was used for smelting the iron ore of the neighbourhood long before its coal was utilised. All kinds of metallic goods are turned out here, from the proverbial pin at Birmingham to the anchor at Tipton. Nail and chain making are carried on at Cradley Heath; locks are made at Walsall and Wolverhampton; keys at Wednesbury; and tin-plate, gun-barrels, armour-plate, great girders, and railway plant of all kinds are turned out in the numerous factories of the busy district of which Birmingham is the chief city. This region is distinguished among the other industrial regions of the country by its large number of small workshops.

On the Yorkshire-Nottinghamshire coalfield the iron industries are centred round **Sheffield**. The **Sheffield district** is famous for cutlery and tools of every kind, and, in addition, every sort of steel work is made—iron plates, engine castings, shot, rails, and machinery of all kinds. Both coal and iron are found in the neighbourhood; but for the finer steels the black iron ores from Sweden are imported. Rock is also found

near Sheffield which makes exceptionally fine grindstones, suitable for use in the making of cutlery. Here, as in the Birmingham district, electroplating is an important trade. Leeds is also an important centre for iron goods.

Textile Machinery to supply the woollen manufacture of the West Riding of Yorkshire is made at Keighley and Bradford. The machinery used in the cotton manufacture is made on the Lancashire coalfield at Oldham, Rochdale, Bury and Manchester. Here engineering works turning out materials for railways and buildings are numerous.

On the **Northumberland-Durham** coalfield railway plant construction, shipbuilding, and gun-making are the chief metallic industries. This region is the most important in England for shipbuilding, which is carried on at Middlesbrough on the Tees, Sunderland on the Wear, and at the Tyne ports, North and South Shields and Newcastle. On the Tyne is the famous ordnance factory at Elswick.

Shipbuilding is also carried on at Barrow-in-Furness and at Belfast, which obtains its iron from Scotland.

All kinds of metallic work are carried on on the **Scottish** coalfield, but more particularly in and around Glasgow. The shipbuilding on the Clyde, at Greenock, Port-Glasgow, Dumbarton and Glasgow, is still the most important in the world. The engineering works of Glasgow turn out railway plant of all kinds, including locomotives, machinery, and every sort of iron goods.

Recent Developments.—In recent years considerable changes have taken place in the metal industries. The tinplate industry, which formerly flourished in

South Wales, has declined in consequence of the development of the same industry in the United States, formerly one of its chief markets. The export of iron has become relatively less important. In most of its markets the United Kingdom has to compete with the manufactures of other nations, more particularly with those of the United States, Germany, and Belgium. At the present time, however (1899), the iron industry was never more active in the United Kingdom. This is due to the development of electrical engineering for supplying electric light and electric tramways; to the growth of cable and ordinary tramways in our great cities; and to the extra activity in all the shipbuilding yards, a consequence partly of the actual demand for greater transport facilities for the world's rapidly growing commerce, and partly of the great increase of naval armaments by our own and other countries, a fair proportion of all foreign ships being built in the United Kingdom.

The universal use of the bicycle in recent years has led in Coventry to the substitution of this manufacture for silk-ribbon weaving, which had for some years been declining. Bicycle-making is also actively carried on in most of the other iron centres, more particularly in Birmingham and Wolverhampton. Sewing-machines are made near Glasgow.

The Chemical Industries.

It is difficult to overestimate the importance of chemical industries in the modern industrial world. The only iron ores successfully smelted in this country were the hematites of the Forest of Dean and Furness, until, by the proper application of physical and

chemical processes, ores such as those of the Cleveland Hills in Yorkshire, formerly refractory, were rendered suitable for smelting. In addition to improved processes of metal-working, many by-products of various manufactures, which were formerly considered waste, have been utilised as raw materials by the application of proper chemical methods. Coal-tar, a by-product in the manufacture of gas, has been applied to many uses, and, among others, is made to yield an important series of aniline dyes. Dye substances were formerly either of vegetable origin, like madder and indigo; animal, like cochineal; or pulverised minerals, like hematite. Now aniline dyes are mainly employed.

Salt, mined in Cheshire and Durham, is used in the chemical-works of South Lancashire and the Tyne, and as the basis of alkalies for bleaching and other purposes.

Sulphuric acid, which is used in many industries, is manufactured in the centres just named and around Glasgow.

Glass-making from silica (pure sand, quartz, flint), mixed with salt, soda, lime, potash, and lead, is the principal industry of St Helens in South Lancashire, and is important at Newcastle.

Soap is made by heating fatty substances with soda to form hard soaps, or with potash to form soft soaps. Tallow and vegetable oils—especially palm, coco-nut, and cotton-seed oils—are used. As the latter are all imported, soap-making naturally flourishes in a seaport such as Glasgow. Glycerine is a by-product of soap-making.

The manufacture of candles, paraffin, &c. from oil-shale is carried on mainly in Mid and West Lothian.

Paper is made by bleaching vegetable fibres, usually esparto grass, or wood fibre combined with cotton or linen rags. These are reduced to a fine pulp, which is rolled and dried into a continuous web of paper. In Midlothian, round Edinburgh, and in Kent and London, where most printing is done, are many printing-paper factories; but many mills exist in other parts of the country.

Tanning is a process for preserving the hides of all kinds of animals and transforming them into leather. Most of the domestic animals supply the skins, which are treated with some solution containing tannin, such as can be obtained from oak and other bark, acorns (valonia), cutch, gambier, &c., or compounds of chromium.

Industries connected with Food and Drink.

Preserved Foods.—In olden times food for winter was preserved by drying, smoking, and salting. At the present day, when transport facilities provide a continual supply of fresh food, this is no longer so necessary; but fish and bacon are still salted and smoked to preserve them and to improve their flavour. At the fishing centres, more particularly those distant from market, drying, salting, and smoking fish is an important occupation. Herring, haddock, and cod are the chief fish preserved. Finnan (Findon) haddocks in Scotland, and Yarmouth bloaters in England, are important articles of trade.

A little home meat is preserved in tins for use at sea; but the great bulk of our tinned food is imported.

Small fruits are made into jams and jellies in London and the neighbourhood, and on fruit-farms

in other parts of the country. Orange marmalade is made in Dundee and elsewhere.

Sugar is refined at Greenock, and made into sweet-meats in all large cities. It is combined with cacao (commonly called cocoa) to make chocolate in Bristol, York, and other places.

Dairy Produce, such as butter and cheese, is made in Ayrshire, Cheshire, the Midlands, Gloucestershire, and the south-western counties of England, and in Ireland.

Brewing and Distilling.—The juice of apples and pears is fermented to form cider and perry in the south-west of England, especially in Hereford and Devon; but by far the most important drinks manufactured in the British Isles are beer and whisky, both derived from barley.

Beer is made by allowing the barley grains to germinate, when the starch of the grain is changed to sugar, and the grain is called malt. The sweetened liquid extracted from the malt is fermented by the yeast-plant, and flavoured with hops. Beer is chiefly brewed in the three capitals, London, Edinburgh, and Dublin, and at Burton-on-Trent, which is near the hop-fields of Worcestershire, and possesses a large and suitable water-supply. The anthracite of Wales can be easily transported to Burton, which has a world-wide celebrity for its beer. Brewing is also carried on in all our large cities. Stout, a beer impregnated with burnt sugar, is mainly brewed in London, Burton, and Dublin.

In Scotland and Ireland the malted liquor is distilled to form whisky, which is manufactured in all the large cities. In Ireland and the Highlands of Scotland a special flavour is imparted to the whisky by the smoke of burning peat.

CHAPTER V.

TRADE ROUTES AND CENTRES.

Towns and Trade.—In Roman times almost all the towns were fortified places. Many of them can be identified by their names—Chester, Worcester, Winchester, Cirencester, &c.—which are derived from *castra*, the Latin word for camp. Even at that date, however, and, indeed, from the earliest days of human habitation in our islands, certain spots, such as fords, or the junction of two valleys or rivers, presented special advantages for meeting-places, more especially between those who had commodities to exchange. As population and trade increased most of these naturally grew into towns of greater or less importance. At a later date abbeys and monasteries attracted a considerable population, composed of members of religious houses, their pupils and servants, those who resorted to them for healing and other benefits, and the artisans, craftsmen, and traders required in a growing community. Our towns, therefore, have grown up in various ways. Some, like Warwick or Chester, developed out of fortified places; others, like Oxford, out of monasteries; others again out of such centres of local trade and traffic as fords, bridges, or ports. Many of these, such as Wallingford, Cambridge, Newport, Exmouth, can be recognised by their names. A group of ancient market centres, Chipping, Chipping Norton, Chippenham, Chepstow, and others, were places where *chapmen* or merchants met to sell or barter

their wares. These owed their importance to the fact that shopkeeping was little developed in the early Middle Ages, and that trade was chiefly carried on at such markets and at periodical fairs, held once a year or oftener, and lasting for days or weeks, like Stourbridge Fair, near Cambridge, which was known throughout Western Europe, and flourished in full vigour up to the middle of the eighteenth century.

In addition to the many towns well fitted to be busy centres of local trade, a few have always possessed special natural advantages marking them out for commercial greatness. Of such we have an excellent example in London, standing at the head of the tidal waters of the Thames. Here a ford existed in early times, replaced later by a bridge. Combining facilities for sea and land communication, and serving as an outlet for the rich south-east of England, London early became the chief commercial town of England, and replaced Winchester as the political capital. Bristol, on the Severn estuary, possessed a very similar situation; but, commanding a less rich district, and being comparatively remote from the Continent, it never became the rival of London.

The modern development of manufactures and railways has led to a corresponding development of towns. The application of steam-power to production has made the coalfields industrial centres, while its application to transport has facilitated the rise of many inland towns, especially of those at the intersection of different routes. Other things being equal, however, proximity to the sea must ever be an advantage; and the rapid growth of our foreign trade, combined with that of our manufactures, has had the most

marked effect on the prosperity of our ports and of the manufacturing towns near them. At the present day two opposite tendencies are at work. One is shown by the disposition of industry to move to the sea. This is illustrated by the removal of many important engineering firms from inland to coast towns. The second is shown by the construction of the Manchester Ship-Canal, which aims at bringing the advantages of a maritime situation, with its concomitants of cheap and convenient water-transport, to an inland centre.

Internal Transport.—Internal trade is carried on by road, railway, and canal, and by coasting-vessels. The country is covered by a network of railways and canals, which is closest around the great centres, London, Birmingham, Manchester, Sheffield, Leeds, Liverpool, and Newcastle.

Roads.—Roads are seldom employed for long-distance traffic, except where there are no other means of transport. Their chief use is to distribute goods brought by rail, canal, or sea to the nearest station or port. Carts of various kinds are generally employed for this purpose, but occasionally a traction-engine may be seen drawing trucks.

Canals.—The plains of England readily lend themselves to the construction of canals, which cross them in every direction. Most of our canals were made between 1770 and 1830. The utility of many is impaired by their being both too shallow and too narrow to permit barges of fair length, breadth, and depth to pass from one canal to another. Canal-boats are the cheapest and most commodious means of inland transport for any heavy and bulky goods that are not easily damaged, such as coal, metals, hardware, building

materials of all kinds ; and the deepening and widening of our canals is, therefore, an urgent necessity.

Most of the rivers of the plain are canalised and joined by important canals. The chief are those uniting the Trent to the Mersey, the Severn, the Thames, and the rivers flowing to the Wash ; those joining Thames and Severn, Severn and Mersey, Mersey and Yorkshire Ouse ; the Forth and Clyde Canal in Scotland ; and the canals of the Irish plain.

The Thames and the Severn are both canalised, and are connected by two canals, one making use of the Kennet and the Bristol Avon, the other passing from Lechlade on the Thames by Stroud to the Severn. The Thames and the Trent are joined by means of the Grand Junction and Grand Union Canals through Brentford, Watford, Wolverton, Leicester, and the Soar, with branches through Northampton to the Nen, and through Market Harborough to the Welland. The Oxford Canal runs northwards by Banbury, Rugby, and Nuneaton to Burton-on-Trent.

There is a great network of canals round Birmingham, which is joined to the Severn at Worcester, to the Trent by canals through Lichfield, and through Tamworth, and by the Warwick and Napton to the Oxford Canal, which is joined to the Grand Junction Canal.

An important canal system, the Trent and Mersey Canal, joins the Trent to the Mersey through the Potteries, making use of the river Weaver.

Three canals cross the Pennines. Two of these unite the Irwell at Manchester to the Calder ; the southern one passing through Huddersfield, the northern one by Rochdale. Still farther north, the Leeds and Liverpool Canal passes through Blackburn, Burnley, and Skipton. A branch of this canal joins Preston and Blackburn.

The rivers flowing east into the Humber and the Wash are all canalised.

The Forth and Clyde are connected by canal from Grangemouth to Glasgow, with a connection to Edinburgh by the Union Canal. In Ireland the Grand and the Royal Canals join the Liffey to the Shannon. The former joins the Shannon between Lough Ree and Lough Derg, the latter near Longford. The Erne

and Shannon Canal connects these two rivers, and the Ulster Canal unites the Erne to the Blackwater and Lough Neagh, whence it connects with the sea by the Bann and by another canal with the Lagan. The deep Newry Canal, three miles long, joins Newry to Carlingford Lough.

Ship-Canals.—There are several ship-canals which are of importance in connection with the coasting and foreign trade. Some of these are natural waterways artificially deepened. All the chief rivers are constantly dredged to allow the largest vessels to enter the docks of the great ports, and thus the Thames, the Tyne, the Bristol Avon, and the Clyde may be regarded as great ship-canals. A ship-canal joins Gloucester to the navigable part of the Severn. The great Manchester Ship-Canal, from the Mersey to Manchester, is wholly artificial.

The Manchester Ship-Canal is thirty-five and a half miles long, and unites the Mersey estuary at Eastham with Manchester, *via* Runcorn and Latchford, by a waterway twenty-six feet deep and one hundred and twenty feet wide at the bottom. The first twenty-one miles to Latchford are without locks. Between Latchford and the docks at Salford and Manchester, where there are over five miles of quays, four locks raise vessels sixty feet.

In Scotland the Crinan Canal saves a long voyage round the Mull of Kintyre to vessels going from Glasgow to the north-west; and the Caledonian Canal, through Glenmore, allows vessels of moderate draught to pass from Loch Linnhe to the Moray Firth, and avoid the stormy voyage across the Pentland Firth.

Railways.—On the plains railways compete with canals for the transport of commodities, while in the more mountainous districts they are practically the only means of carrying on trade.

London, the capital as well as the chief port and

market, is naturally the centre of the railway system of the country. From this centre important lines radiate in all directions, like the spokes of a great wheel. The terminal points are either ports or great industrial towns, which, in their turn, are the centres of minor systems of radiating lines, connecting them with each other. The country is thus covered with a network of lines too complex to describe in detail, by which every town of any size is connected with the Metropolis, ports, and industrial centres, frequently by several alternative routes. This network is most closely interwoven on the plains, while in the mountainous districts all the great valleys form railway routes, except in the outlying and thinly peopled districts of Wales and Scotland, which are of little commercial importance. The effect of this keen competition is to facilitate transport and to reduce rates.

In 1850 there were less than seven thousand miles of railways in the United Kingdom. During the next twenty years the mileage was more than doubled. At the end of 1897 the total length of railways was over twenty-one thousand miles, of which nearly fifteen thousand miles were in England and Wales, over three thousand four hundred miles in Scotland, and rather less in Ireland.

From a commercial point of view a detailed knowledge of the great main lines is of less importance than a clear understanding of the facilities of transport between the various industrial towns and districts and the ports or other centres from which they obtain raw materials, or to which they distribute finished products. For convenience of reference, however, the customary grouping by main lines—a system based rather on

passenger than commercial traffic—is followed ; but it should be remembered that this simpler classification tends to disguise the complexity of the railway systems from a commercial point of view.

Main Lines connecting London with the Western and Southern Counties.—The Great Western (G.W.R.), with the longest mileage in the United Kingdom, connects London with Birkenhead through the manufacturing centres of the Midland coalfield, and with Exeter and the southern counties. The London and South-Western (L.S.W.R.) competes with the G.W.R. for the Exeter traffic, and carries a considerable proportion of the French and Continental traffic by way of Southampton. The traffic of the south-eastern counties—with much for France—is divided among the London, Brighton, and South Coast (L.B.S.C.R.), running to Portsmouth and Newhaven ; and London, Chatham, and Dover (L.C.D.R.), and the South-Eastern (S.E.R.), running to Dover. The eastern counties traffic—with much for the Continent by way of Holland and Belgium—is carried by the Great Eastern (G.E.R.).

The G.W.R. main line runs from London (Paddington) through Reading, Didcot, Swindon, Chippenham (branch to Weymouth, for Channel Islands service), Bath, and Bristol (branch to South Wales by the Severn Tunnel), to Exeter, with connections to Barnstaple, Plymouth, and Penzance. Its main branches are (a) through Didcot, Oxford, Birmingham, Shrewsbury, and Chester (for the Welsh and Irish traffic) to Birkenhead ; (b) through Swindon, Gloucester, Cardiff, to Swansea, Pembroke, and Milford.

The L.S.W.R. runs from London (Waterloo) through Woking (branch to Portsmouth), Basingstoke (branch to Winchester and Southampton), Salisbury (branch to Weymouth), and Yeovil Junction to Exeter, whence it is continued to Plymouth.

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The L.B.S.C.R. runs from London (Victoria and London Bridge) through Oxted to Eastbourne, through Lewes to Newhaven, through Redhill to Brighton, through Chichester to Portsmouth; and a line follows the south coast from Hastings to Portsmouth.

The L.C.D.R. runs from London (Victoria, Holborn Viaduct, and St Paul's) through Gravesend, Rochester, Chatham, Sittingbourne (for Sheerness and Queenborough), Faversham (for Margate and Ramsgate), and Canterbury to Dover.

The S.E.R. runs from London (Charing Cross and London Bridge) through Tunbridge (branch to Hastings), Ashford (branch through Canterbury to Ramsgate and Margate), and Folkestone to Dover.

The G.E.R. runs from London (Liverpool Street) through Colchester, Manningtree Junction (branch to Harwich), Ipswich (branch to Norwich), Beccles Junction (branch to Lowestoft), to Great Yarmouth. Another line runs from London through Cambridge, Ely (branch through Lynn to Hunstanton, and another to Norwich), March (branch to Peterborough), and Lincoln to Doncaster, connecting there with the G.N.R. and the N.E.R.

Main Lines connecting London with the Midlands and North of England.—The traffic of the midland and northern counties is carried from London by the Great Northern (G.N.R.), continued by the North-Eastern (N.E.R.)—opening up the Yorkshire and Northumberland and Durham coalfields—to Berwick, the east coast centre for the Scottish traffic; and by the London and North-Western (L.N.W.R.)—connecting the capital with the great industrial district of South Lancashire—or the Midland (M.R.)—connecting it with the Midland and Yorkshire industrial towns—to Carlisle, the west coast centre.

The Great Central (G.C.R.), formerly the Manchester, Sheffield, and Lincoln, also connects the capital with the manufacturing towns of the Lancashire and Yorkshire coalfields. The Lancashire and Yorkshire

(L. & Y.R.) serves south Lancashire and Yorkshire, but is not directly connected with the Metropolis.

The G.N.R. runs from London (King's Cross) through Peterborough and Retford to Doncaster, whence it is continued by the N.E.R.—radiating over the north-eastern counties—through York, Darlington, Durham, and Newcastle to Berwick.

The L.N.W.R. runs from London (Euston) through Rugby (branches to Peterborough and Birmingham), Stafford (branch to Birmingham), Crewe, Wigan, Preston, and Lancaster, to Carlisle. From Crewe, branches run (a) by Chester and the Menai Bridge to Holyhead (for the North Wales and Irish traffic); (b) through Stockport and Huddersfield to Leeds; (c) through Stockport to Manchester; (d) to Liverpool over Runcorn Bridge. From Liverpool a line runs to Leeds *via* Manchester.

The M.R. runs from London (St Pancras) through Bedford, Leicester (branches to Peterborough and Rugby), Trent Junction (branch to Derby, and branch to Nottingham and Lincoln), Chesterfield, Sheffield, Leeds, and Settle (branch to Morecambe), to Carlisle. Branches run (a) from Trent through Derby and Ambergate to Manchester and Liverpool, (b) from Bristol through Gloucester, Cheltenham, Birmingham, Burton, Derby, and Ambergate, connecting with the Carlisle line at Chesterfield.

Both the M.R. and L.N.W.R. pass through Carnforth to Barrow and West Cumberland over the Furness Railway.

The G.C.R. runs from London (Marylebone) through Aylesbury, Rugby, Leicester, Nottingham, and Sheffield (branches to Lincoln and Grimsby) to Manchester (centre of the Cheshire lines, jointly controlled by the G.C.R., M.R., and G.N.R.) and Liverpool.

The L. & Y.R. main line runs from Liverpool by Wigan to Manchester, and by Wigan, Bolton, Rochdale, and Halifax to Bradford and Leeds. It serves all the towns of South Lancashire, connects with the M.R. at Normanton and Hellifield, and the L.N.W.R. at Preston, whence both lines run to Fleetwood.

The North Staffordshire serves the region it is named after, and runs through Stoke, from Crewe to Derby, and from Macclesfield to Stafford.

Scottish, Welsh, and Irish Railways.—The Scottish lines radiate from Edinburgh and Glasgow, but it is

convenient to trace them from Carlisle and Berwick, where they connect with the great English lines.

The three regular through passenger routes from London to Scotland are: (1) the East Coast Route by the G.N.R. and N.E.R. to Berwick, and thence by the eastern branch of the North British (N.B.R.) through Dunbar to Edinburgh and Glasgow; (2) the West Coast Route, by the L.N.W.R. to Carlisle, and thence by the Caledonian (C.R.) to Edinburgh, Perth, or Glasgow; and (3) the Midland Route, by the M.R. to Carlisle, and thence by the Western or Waverley branch of the N.B.R. to Edinburgh, or by the Glasgow and South-Western (G. & S.W.R.) to Glasgow.

Both the C.R. and N.B.R. main lines run to Aberdeen, where a connection is made with the Great North of Scotland (G.N.S.R.) for the north-eastern counties. Perth, reached by both lines, is the starting-point for the Highland Railway (H.R.), which opens up the Highlands and the northern counties; while Glasgow is the centre for the West Highland traffic, which is sent over the West Highland line by Loch Lomond and the desolate Moor of Rannoch to Fort William.

The C.R. connects with the English railways at Carlisle, and runs through Lockerbie, Carstairs (branch to Edinburgh on the east), Motherwell (branch to Glasgow on the west), Stirling, Dunblane (branch through Callander to Oban), Perth, and Forfar to Aberdeen.

The N.B.R. connects with the English railways both at Carlisle and Berwick. From Carlisle the western branch runs through Hawick and Galashiels (Tweed woollen district) to Edinburgh, outside which city it is joined by the eastern branch from Berwick. Glasgow is reached through Edinburgh either by Falkirk or by Bathgate and Airdrie. From Edinburgh the main line runs to



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Dalmeny, where it is joined by the Glasgow branch, and over the Forth and Tay Bridges to Dundee, Arbroath, Montrose, and Aberdeen.

The G. & S.W.R. runs from Carlisle through Dumfries (branch to Stranraer) and Kilmarnock to Glasgow.

The H.R. starts from Perth and follows a picturesque route along the glens and over the passes of the Highlands, through Dunkeld, Blair Athol, Aviemore (branch to Forres, Nairn, and Elgin), Inverness, Dingwall (branch to Strome Ferry), and Tain, to Wick and Thurso.

The G.N.S.R. runs from Aberdeen to Elgin, with branches to Banff, Peterhead, and Fraserburgh.

The Welsh traffic is chiefly carried on by the G.W.R. in the south and the L.N.W.R. in the north, both with numerous branches. The Cambrian has a considerable mileage in the centre. In South Wales numerous parallel lines running more or less north and south, sometimes in the valleys, but generally along the heights, connect the collieries with the coast.

In Ireland the railways radiate from Dublin. The Dublin, Wicklow, and Wexford Railway serves the counties named. The Great Southern and Western Railway runs to Cork and Limerick by Kildare and Charleville, with branches to Kilkenny and Athlone. The Midland Great Western crosses the island to Galway, Clifden, Westport, and Sligo. The Great Northern (Ireland) unites Dublin to Belfast and Londonderry through Drogheda and Dundalk, and the Northern Counties Railway joins Belfast and Londonderry through Antrim, and also runs to Larne.

Chief Trading Centres.—The internal trade of the British Isles is greater at the present day than at any other period. It is also greater than that of any other country. Each mining or manufacturing centre has

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its great trading town, where most of the business of buying and selling is carried on. Birmingham in the Black Country, Sheffield in the South Yorkshire iron district, Leeds in the woollen district, Manchester in the cotton district, Newcastle-on-Tyne in the northern coal and iron district, are the great commercial centres of industrial England. With the exception of Newcastle, these are all practically connected by a series of smaller towns. Cardiff is the commercial centre of South Wales. In Scotland, Glasgow, and in Ireland, Belfast and Dublin have become commercial capitals.

London.—London is a great central market, receiving commodities from all parts of the country and from abroad, and redistributing them both to home and foreign markets. Imported agricultural and food products of all kinds, such as tea, coffee, sugar, groceries, as well as all kinds of fancy goods and luxuries, are sent from it to other towns. In the same way coal, chiefly from the Midland coalfield, manufactured goods, jewellery, and hardware from Birmingham, cutlery from Sheffield, woollen goods from Yorkshire, and cotton goods from Lancashire, all pass through the wholesale London warehouses. Dairy, farm, and garden produce are brought from the country and the Continent to supply its great markets and feed its six million inhabitants. Special fish and meat trains arrive during the night at the great London stations, loaded with food supplies, which are sold the next morning. The city and suburban traffic is carried on by the main lines of which it is the centre, and by two local lines, chiefly underground—the District and the Metropolitan.

The chief London markets are Billingsgate for fish ; Smithfield

and Leadenhall for meat, game, and poultry ; Covent Garden and Smithfield for fruit and vegetables. There is a Metropolitan market for home cattle, and a Deptford market for foreign cattle.

Staffordshire.—Birmingham manufactures large quantities of jewellery, and is the centre of a district which produces hardware of every description. These wares are sent to London—whence they are largely redistributed to the great northern industrial towns—and to Gloucester, Liverpool, and Hull for shipment abroad. Like London and all large manufacturing centres, it obtains its food-supplies from home and foreign sources, receiving daily supplies of the more perishable, for the quick transport and delivery of which special arrangements are made by the railway companies.

The Staffordshire potteries and the Burton breweries distribute their goods in the same way.

South Lancashire.—Cotton goods, the staple of South Lancashire, are consigned from the surrounding districts to Manchester, whence they are distributed to Liverpool, Hull, and other ports for shipment, and to all parts of the country for home consumption. The raw materials enter mainly by Liverpool or by the Manchester Ship-Canal ; and large quantities of food from foreign and colonial sources are consigned to Manchester by these routes.

Salt from the **Cheshire** mines and chemicals from South Lancashire are distributed to both the Lancashire and the Yorkshire manufacturing districts, as well as to other home and foreign centres.

West Riding of Yorkshire.—Leeds and Bradford serve as the emporia for the West Riding woollen centres, whose wares they distribute partly by rail and partly by sea, through the ports of Goole, Hull, and Liverpool.

Cutlery and armour-plates from Sheffield are distributed in the same way.

From **Northumberland and Durham** the North-Eastern Railway carries coal, iron goods, and chemicals to all the surrounding districts, and to Newcastle, Sunderland, Middlesbrough, and other ports.

The railways in the **Lowlands of Scotland** carry much coal to the ports for foreign trade in addition to distributing it to the inland parts of the country. The North British Railway distributes the woollen goods of the Tweed valley, and shares all the varied trade of the Glasgow district with the Caledonian Railway and the Glasgow and South-Western Railway.

Ports.—London is the port nearest the heart of the south-eastern region of England, and is opposite the great Continental ports, more particularly those at the mouth of the Rhine, with which a constantly active trade is carried on, not only from London, but from other ports on the east and south-east coast of England. The Continental packet stations, outports of London, are Harwich, Dover, Folkestone, Newhaven, Southampton, and Weymouth. Southampton has grown in recent years to be the port for great liners to the East and to Africa, and for London passengers to America. The western ports sprang into importance after the doubling of the Cape of Good Hope and the discovery of America. Bristol and Plymouth were the most important of these until the application of steam-power to industry and the rise of great manufacturing centres round the South Wales, Midland, Lancashire and Yorkshire coalfields raised Liverpool, in the west, and Hull, in the east, to the rank of first-class ports. Cardiff, Newport, and Swansea have grown with

the development of mining and metal-working on the South Wales coalfield. From early times Newcastle shipped coal to London; but the other Northumberland and Durham ports, North Shields, Tynemouth, Sunderland, together with Middlesbrough, in Yorkshire, have become important only in recent years with the development of coal and iron industries and the manufacture of chemicals. Silloth is the port for this region in the west, and south of it Maryport, Workington, and Whitehaven are outlets for the Cumberland coalfields.

In Scotland, as in England, the east coast ports were long the most important, and trade was carried on, more particularly with France, through Leith. Now Leith, Grangemouth, Burntisland, and Dundee still carry on an extensive coasting and Continental trade; while the Clyde has become the busiest commercial centre in Scotland. Greenock, Glasgow, and Ardrossan are the chief ports. Aberdeen sends out granite and manufactured goods.

The great ports of Ireland, such as Belfast, Dublin, Waterford, and Cork, are all in the east or in the south, nearest Britain and the Continent, and serve as outlets for the agricultural products and salmon of Ireland, and as inlets for manufactured goods from Great Britain. The east coast is not only nearest the richest land of Ireland, but is opposite Great Britain. The west coast of Ireland has numerous natural harbours; but a natural harbour alone does not suffice to make a port, which must have easy communication with land producing commodities for which there is a demand. The west of Ireland is chiefly pastoral, and is unable to support more than a coasting trade. Limerick,

which forms the outlet for the Golden Vale, is by far the most important port on the west coast.

The routes between Great Britain and Ireland are numerous. Scotland sends goods and passengers from Glasgow and Greenock to Londonderry, Belfast, and Dublin ; and swift boats run daily between Ardrossan and Belfast, and between Stranraer and Larne, the latter the shortest sea-route between the two islands. The north of England ports, Barrow, Fleetwood, and Liverpool, do a large cross-Channel trade with Belfast, and also trade with the Isle of Man. Liverpool is also directly connected with Drogheada, Dublin, Cork, and other ports. The quickest service from London to Dublin is by the mail route *via* Holyhead to Kingstown or Dublin direct. Steamers also sail from Holyhead to Greenore for Belfast. Both New Milford and Bristol are in regular communication with Waterford and Cork.

All the ports of the British Isles have regular steam communication with each other every few days.

CHAPTER VI.

OUR FOOD-SUPPLY.

IN olden times our country was dependent on its own products for the food of its inhabitants, who were forced to subsist on what could be grown in their own immediate neighbourhood. In bad years considerable distress was therefore felt, while actual famines were not unknown. The choice of food was also more limited than at present, and some districts offered less variety than others.

In the Tweed valley servants formerly stipulated for a clause in their contracts forbidding salmon to be served more than three times a week. Nowadays few masters feed their servants on salmon even three times a year. It is no longer the commonest

fare either in Tweeddale or elsewhere, but is a luxury within the reach only of the well-to-do. Its value has increased even in regions where it is abundant, while the value of other foods has fallen. No doubt salmon have become scarcer, but the change in relative value is in large part due to the development of transport facilities, which permit salmon to be forwarded to distant markets, and other kinds of food to be cheaply brought from other parts.

This increase in transport facilities is part of a general economic change which has come over this country during the last century and a half, transforming Great Britain into a great manufacturing country. The increased power of production resulting from the use of steam-power has led to an enormously rapid increase of population, especially in the non-agricultural section of the community. The home food-supply has not kept pace with this increase of population, and the bulk of our food now comes from the uttermost parts of the earth in great steamers which occupy only a few weeks on the voyage. Nearly £200,000,000 are spent annually on imported food.

Food products, using the term in the widest sense, may be divided into cereals, fish, flesh, dairy produce, fruits, and drinks. The cereal most in demand is wheat. It is long since the wheat-lands of Britain ceased to supply enough wheat for the people of the United Kingdom, and since the removal of the heavy duties once levied on foreign wheat the import of this cereal has gone up by leaps and bounds. At the end of the nineteenth century it was more than double the quantity imported thirty years previously.

The latter half of the nineteenth century has been marked by the colonisation and cultivation of many lands formerly occupied by wandering hunters or

herdsman. The extension of the wheat-growing area has enormously increased the world's food-supply, and has created a surplus which is sent mainly to Europe, and very largely to the United Kingdom. The most important of these new wheat-lands are the North American prairies, west of the Alleghenies and the Great Lakes. In Europe, the *puszta*s of Hungary, the Wallachian plain, and the rich black lands of southern Russia are the great wheat-producing regions. All these regions are relatively sparsely peopled, and in some—for example, in Russia—rye and not wheat is the cereal consumed by the inhabitants themselves. There is consequently a large surplus for export to western Europe. In India excellent wheat is grown in the north-western regions under irrigation. The Plate basin in South America is another source of our wheat-supply, and its resources are as yet by no means fully developed. Australia used to send us large supplies, but practically none since 1895. In addition to these wheat-lands there are two vast areas which, though as yet comparatively undeveloped, might be made to produce enormous supplies of wheat. These are the plains of western Canada and southern Siberia. Until these virgin lands are more or less exhausted, there will be a natural increase in the world's wheat-supply; but in a few decades a more careful and intensive cultivation of the wheat regions will be essential, as most of the available free land will doubtless in that time be fully utilised, even in the higher lands of Africa.

American wheat is sent east to the Atlantic ports, more particularly to New York, Boston, Montreal, and Quebec, by the great railways of the United States and Canada, and the Great Lakes and the canals which connect them either with the

Hudson or the St Lawrence. Much United States wheat is exported in the form of flour, ground largely at Minneapolis, on the Mississippi, at the foot of the great St Anthony Falls, which supply water-power for turning the numerous flour-mills. The finest flour is imported into this country from Hungary, and it is remarkable that this is superior to that ground in this country from Hungarian wheat. Hungarian wheat is exported partly from the port of Fiume on the Adriatic, but most of the Danube valley crop finds its way down the river to Braila and Galatz, near its mouth, where it is shipped westwards. Russian wheat is brought across the plain to Odessa, to Kherson at the mouth of the Dnieper, and to Taganrog at the mouth of the Don. Wheat is also shipped from the Baltic ports. Indian wheat is shipped mainly from Karachi; Australian from Sydney, Melbourne, and Adelaide; South American from the Plate River.

More than 60 per cent. of our imported wheat and flour comes from the United States, nearly one-third of it as flour; one-fifth from Russia; and about one-thirteenth from Canada, the most important of our colonial sources of wheat.

Maize, the cereal next in importance, is imported more as a feeding substance for our live-stock than for human food, though much is turned into corn-flour at Paisley and elsewhere. It comes chiefly from the centre of the Mississippi basin in North America, and is sent from Chicago by rail and by the Great Lakes and the Erie Canal to New York, or down the Mississippi to be reshipped at New Orleans.

The other cereals, more particularly barley, oats,* and rye, and the pulses—peas and beans—are also largely imported. Barley is chiefly used for brewing and distilling, and is imported mainly from Russia, the Danube provinces, Asiatic Turkey, and the United

* Oats come from the United States, Russia, and Canada, rye and peas from the United States and Canada, and beans from Asiatic Turkey and Egypt.

States. The other substances named are employed more for feeding stock than for human food.

Rice, the only other important cereal, is brought from Burma through Rangoon, and from Bengal.

Dairy Produce and Eggs.—Butter and margarine, cheese, eggs, and milk are important articles of food which our dairies and poultry-farms do not supply in sufficient quantity.

Butter is largely obtained from Denmark, Sweden, Holland, and the north of France, whence supplies can be delivered in British markets before they have time to deteriorate in quality. In recent years the introduction of refrigerating chambers into large steamers enables dairy produce to be brought fresh from the farthest regions, and Australian and Canadian butter is now a common article in the English market. Cheese comes principally from Canada, where careful technical education has made the farmers of Ontario the most skilful cheese-makers in the world. Large quantities also come from the Northern United States. Cheese is also imported from Holland, Belgium, Switzerland, France, and New Zealand. Over £1,000,000 worth of eggs are annually obtained from France alone; about £800,000 worth from Germany, Russia, and Belgium respectively; and £600,000 worth from Denmark. Considerable numbers come from Canada. Condensed milk is imported from Switzerland and Norway.

Fish.—The home supply of fish is very large, and more is exported than imported. Fresh herrings are brought from Scandinavia, other kinds of fresh fish from Norway and Holland, and oysters from the United States and France. Frozen salmon from Canada is becoming common in the markets of London and the

larger ports, and canned salmon, lobsters, and oysters are imported in large quantities from Canada and the United States. Sardines, preserved in oil, are imported from French and Portuguese fisheries, and anchovies, in oil or brine, are obtained from Italy and Norway. Both are luxuries rather than staple articles of food.

Flesh.—Meat is imported partly in the form of live animals, partly as dead carcasses, partly as salted or preserved meat. Live cattle are sent mainly from the United States, Canada, and Argentina, through New York, Boston, Montreal, Quebec, and Buenos Ayres. From the same countries and from Australia and New Zealand large quantities of dead meat are brought over in ships fitted with refrigerating chambers. Sheep are imported from the Argentine Republic, the United States, Canada, and even from Iceland. Frozen mutton is brought from the Argentine Republic, Australia, New Zealand, and the United States. Fresh mutton is imported in considerable quantities from Holland. Little fresh pork is imported, but in the form of imported bacon and ham the flesh of the pig is a very important article of food. Three-quarters of this comes from the United States, and nearly all the rest from Denmark. Beef and pork, salted or preserved in other ways, come mainly from the United States. Canned mutton is brought principally from New Zealand and Australia.

Poultry and Game are brought from various parts of the Continent; dead rabbits from the Continent and from Australia. In the latter country they have long been a pest; but they are now killed for their flesh, part of which is canned, and for their skins.

Fruits.—In recent years, since refrigeration has rendered it possible to bring even the more delicate

fruits from distant parts of the world without deterioration, fruit has become a much more important article of diet in this country. Of temperate fruits the apple is the most important. The home supply is quite inadequate, and several million bushels are imported annually, chiefly from the United States, Canada, and Normandy, though the supply from Tasmania is increasing. Subtropical fruits are obtained from the Mediterranean countries. The most important are oranges, lemons, figs, grapes—either fresh or dried into raisins and currants—olives, almonds, and dates—the last from the borders and oases of the desert. Of tropical fruits the banana is most in demand. It is imported in immense quantities from the Canary Islands, the West Indies, and other countries lying between the tropics. The more expensive pine-apple comes from the same sources. The coco-nut is brought from various intertropical regions, but chiefly from the islands of the Pacific and Indian Oceans.

A large trade is done in fruits preserved in bottles and cans. Apricots, pears, and other fruits are bottled in France, and are finer in quality and higher in price than the many canned fruits imported from the Southern United States, California, the East Indies, and Australia. In addition to dried currants and raisins, dried prunes, plums, and Normandy pippins have long been in use, and dried pears and apricots have been put on the market within the last few years.

Sugar.—Sugar not only forms part of our daily food, but is also the medium in which most fruits are preserved. It is found in every plant, and most fruits are rich in it. Several plants, such as the sugar-cane, sugar-beet, sugar-maple, and sorghum, are cultivated

for the sugar they yield. The sugar-cane grows only in warm, moist regions, and is cultivated in every part of them. It was formerly the staple product of the West Indies, where it is still largely cultivated, as well as in adjacent lands like British Guiana. It is also grown in the East Indies and Queensland. Our chief supplies of cane sugar come from these countries (excluding Queensland). The West Indian sugar trade has suffered during the last century from the competition of beet sugar. The Napoleonic wars at the commencement of the nineteenth century deprived the continental European countries of West Indian sugar, and obliged them to depend on that obtained from the sugar-beet, which could be grown in Europe. This led to a great increase in the cultivation of this plant in the north of France and Germany, in Belgium, Bohemia, Austria-Hungary, and parts of southern Russia. The sugar-beet is not yet grown in this country, though the climate is suitable, and beet sugar (principally from Germany, France, and the Low Countries) forms about two-thirds of our imported raw sugar.

Spices, Flavourings, &c.—In former times, when salted and dried foods were so largely consumed in winter, spices were relatively a much more important article of diet than now, though they are still largely used. From the East Indies, one of the chief spice-lands, come the nutmeg kernel and its covering layer the mace, the dried pepper-berry, the ginger-root, and the mustard-seed. Ginger is obtained from the East and West Indies, and mustard from Asia Minor. The bark of the cinnamon-tree is imported from Ceylon. Zanzibar exports the dried buds of the clove, and Jamaica the pimento or allspice. Vanilla, used for flavouring, is produced

by an orchid growing in India, Central America, and Mexico. Almond-oil is extracted from almond seeds. The only oil extensively used as a food is olive-oil from the olive drupe, the finest qualities coming from the south of France and Italy.

Ice.—Nearly half a million tons of ice are imported annually, chiefly from Scandinavia, for preserving and cooling food in summer.

Stimulants and Narcotics.—Stimulants may be divided into aromatic drinks prepared by infusion and those obtained by fermentation. The former owe their stimulating property to the presence of alkaloids, the latter to that of alcohol.

Tea.—In the British Isles tea is the most important non-alcoholic beverage. It is made by infusing the dried leaves of the tea-plant, which grows well in regions with very warm and moist summers where the slope of the land is sufficient to ensure good drainage. Formerly nearly all our tea used to be imported from China; but in recent years the hills of Assam, Darjiling, and other mountainous parts of India, and the mountains of Ceylon, have supplied the greater portion of the tea used in this country. China tea was shipped from Hankau and the Yang-tse-kiang ports, and from Shanghai and Canton. India tea is shipped mainly from Calcutta, and Ceylon tea from Colombo. Tea is now grown in Natal, Java, and other regions with suitable climates, and might well be introduced into northern Queensland.

The consumption of tea is rapidly increasing in this country: 160,000,000 lb. were consumed in 1880, while the amount consumed in 1897 was nearly 230,000,000 lb.

Coffee is an infusion of the roasted and ground berry of the coffee-plant, which, like cotton, but unlike tea, cannot stand any frost. Most of our coffee comes from the Pacific slope of Central America, British India, Colombia, Brazil, and the West Indies. Brazil and the Dutch East Indies, especially Java, are among the chief coffee-producing regions. Indian coffee comes from the south of that country; very little is now obtained from Ceylon. Coffee has also been introduced into British Central Africa, where a 'bean' of very fine quality is grown.

The consumption of coffee in the British Isles is diminishing, but 750,000 cwt. are still imported every year. This is only half the amount imported in 1880.

Cacao.—Cacao, commonly, but wrongly, called cocoa, is made from the 'nibs' or seeds of the cacao-tree, a plant of American origin which flourishes in Mexico, Central America, the north of South America, and the West Indies, and has recently been successfully introduced into Ceylon. The cacao of Ecuador is shipped from Guayaquil; that of Venezuela from La Guaira; that of Trinidad from Port of Spain. It is also exported from Brazil, Costa Rica, Nicaragua, Salvador, and Guatemala. The consumption of cacao is increasing.

The **kola** nut, from West Africa, yields one of the strongest of all non-alcoholic stimulants. It is used medicinally, and is rapidly passing into common use.

Fermented Drinks.—The alcoholic drinks fermented from barley have already been described (see page 61).

Wine, the fermented juice of the grape, is by far the most important alcoholic drink which is imported. Although the vine can be grown in the south of England and Wales, it is at present of no economic

importance, and wine is obtained chiefly from the vine-growing regions of France, more particularly from the south, where *Cette* is the chief wine-port. *Clarets* are exported from *Bordeaux*, and *Burgundies* from the *Saône* valley. Wine is also imported from Spain (*sherry*), *Portugal* (*port*), *Italy*, *Germany* (*Rhine* wines), and *Hungary*. *Algeria*, in the north of Africa, and the *Cape*, in the south, both export wine. In recent years considerable attention has been paid to vine-growing and wine fermentation in *Australia*, more particularly in *Victoria* and *South Australia*. *Californian* wines are also now in the British market. The distilled liquor obtained from wine is *brandy*. The best brandies are made at *Cognac*, in the west of France, and in the *Champagne* region.

A portion of the spirits imported into this country is distilled in *Germany* from the fermented juice of the *potato*. **Rum** comes from the *British West Indies* and *British Guiana*. Fine liqueurs are prepared by the *Benedictine* monks in *Picardy* and those of *Chartreuse* in *Savoy*. Among many others too numerous to mention may be noticed *Kirsch*, distilled from the *cherry*, and *Curaçoa*, made in *Holland* from the outer rind of the *Curaçao* orange. Practically, every plant can be made to yield alcohol, and numerous fruits and plants are used for the purpose.

Tobacco and Snuff are made from the prepared leaves of the *tobacco-plant*, a native of *America*. The *tobacco-leaf* is rolled into *cigars* or *cheroots*, and in this form it is brought from *Havana* in *Cuba*, *Manila* in the *Philippines*, and from *Mexico*, *Borneo*, *Burma*, and *southern India*. *Tobacco* for smoking and snuffing is imported from the *United States*, several countries of

Europe, and the Levant. Much is imported in the form of dried leaves, which are manufactured into pipe tobacco, cigars, cigarettes, and snuff in our own country.

CHAPTER VII.

IMPORTS OF RAW MATERIALS AND MANUFACTURED ARTICLES.

Raw Materials for Textile Manufacture.—Wool and flax are the only two fibres of textile importance grown in the British Isles, but the home supply of both is quite inadequate. Cotton, hemp, jute, and other vegetable fibres, and silk, camels' hair, and other animal fibres, are all of foreign origin.

Wool.—Most of our imported wool comes from the southern hemisphere, where the merino sheep has been introduced. The chief wool-producing regions are Argentina, South Africa, Australia (south of 20° S. lat.), and New Zealand. Of these, Argentina exports but little wool to this country, which is chiefly supplied from Australasia. The Australian grass-lands are the drier downs south of the twentieth parallel. The wool, which is washed on the sheep-runs before being forwarded to the coast, is exported from the chief ports of the five colonies. In New Zealand the Canterbury plains in the Middle Island are exceptionally suited for sheep-rearing, although sheep are very numerous on the drier parts of the western mountains. In South Africa the grassy Karroos supply scanty pasture. Cape Colony wool, however, is less in demand than Australian, largely

because it is exported uncleaned. Its heavier weight in this condition increases the cost of transport, and consequently its price, while the manufacturer has also to pay the cost of cleaning. This is true to an even greater extent of South American wools.

There are numerous minor regions of wool-supply. For instance, sheep-rearing is almost the only industry of the Falkland Islanders.

The hair of the goat is also used for making woollen goods, especially that of the Kashmir goat and the Angora goat of Asia Minor. The latter has been successfully introduced into South Africa, and its fine hair, known as mohair, is a valuable export from our colonies there. The hair of the camel and of the alpaca of the Andes is also used in the woollen manufacture.

Over 700,000,000 lb. of wool are imported on an average every year, of which more than half is re-exported. The home production is less than 150,000,000 lb. The total amount of raw wool annually manufactured in the United Kingdom is under 500,000,000 lb.

Flax.—In addition to the flax grown in Ulster, lint fibre is imported, mainly from the Baltic, and especially from Russian ports. The finest flax, however, is produced in the south of Belgium, which sends one-fifth of our imports. We are also supplied from Holland. A considerable quantity of flax is produced in southern Russia, in northern Italy, and in western France, but is not brought to Britain. Nearly 100,000 tons are annually imported.

Cotton.—Two-fifths of the world's raw cotton is sent to be manufactured in the British Isles. Cotton consists of the fine hairs growing round the fruit of the cotton shrub, or tree, which is found everywhere

between the tropics, and also in subtropical regions. The hair is separated from the seeds by the process called ginning, and the 'cotton wool' is then packed into bales weighing about 440 lb. each. In the sixties about 10,000,000 cwt. of raw cotton were imported every year; but the quantity is now between 50 and 60 per cent. more, and in 1898 was as much as 19,000,000 cwt.

The United States of America are by far the most important source of our cotton-supply, for three-quarters of the raw cotton of the world is grown there. The cotton-plant cannot flourish in regions where frost occurs, and while it does not require exceptionally great moisture, it needs long, warm summers to ripen the seeds. The south-eastern United States have a climate admirably suited for its growth, and in the sandy soils of Georgia and South Carolina plants producing the finest and longest fibres are raised. This is known as sea-island cotton, which has been introduced from this region into Egypt, Queensland, and different islands in the Pacific. The American ports chiefly engaged in shipping sea-island cotton are Charleston, Savannah, and Wilmington. A cotton with a shorter staple, known as upland cotton, is grown farther inland. This is largely shipped from the Gulf ports, such as Galveston, New Orleans, Pensacola, and Mobile.

The delta of the Nile, with its very dry air and abundant moisture derived from the river, is well suited for the growth of fine cotton; and Cyprus and other parts of the Mediterranean are equally good cotton lands. Much cotton is shipped to this country from Alexandria and Smyrna.

The black soil of the Deccan in India to the east of the Western Ghâts, where the summer rains are not excessive, yields rich crops, which are shipped chiefly from Bombay. Of the minor cotton-growing regions, Brazil is the most important. It ships its cotton from Rio de Janeiro and Pernambuco. We also receive supplies from Peru.

About 10 per cent. of the raw cotton imported is exported.

Silk.—Nearly 2,000,000 lb., about £1,250,000 worth, of raw silk is imported into the United Kingdom every year; £500,000 worth of husks and waste, and about £350,000 worth of thrown silk are also imported annually. Silk is obtained from the cocoon of the silkworm, which feeds on the leaves of the mulberry, oak, and other trees of China, Japan, the Mediterranean region, and other parts of the world. Most of our supply comes from France, China, and India.

Jute.—Jute is the coarse fibre obtained from the jute-plant, which grows only in the rich alluvial soils of warm, moist regions. The bulk of our supply, about 350,000 tons per annum, is grown in the delta of the Ganges. It is shipped from Calcutta in sailing-vessels, as its value is too small to pay for steam transport.

Hemp.—Hemp is widely distributed; but most of that used in this country is imported from Russia, Germany, and Italy. Manila hemp, the long fibre of a palm, is imported in very large quantities from Manila in the Philippine Islands. New Zealand produces a fibre known as phormium, or New Zealand flax. The agave of Mexico and Central America yields a fibre known as henique, or sisal hemp, used in the manufacture of twine, rope, &c.

The ramie or **China grass** is the fibre of a plant of the nettle family, grown in many warm lands.

Other Raw Materials of Vegetable and Animal Origin.

Palm-oil, from moist and hot West Africa, and the dried coco-nut, known as copra, from most Pacific islands and the sandy shores of the Indian Ocean, are imported for making soaps and stearine candles. Many trees in the wet jungles of intertropical regions exude a milky juice which when dry becomes elastic, and is known as **india-rubber** or **caoutchouc**. The Brazilian forests supply the best rubber. The port is Pará, at the mouth of the Amazon. Rubber is also imported from West Africa, and from the East Indies, through Singapore. A variety of plants growing on the borders of the desert exude juices which form gums and resins imported either for use as drugs or as the bases of varnishes, dyes, or compounds employed in tanning. They are chiefly brought from East Africa and Arabia.

Substances imported for Tanning and Dyeing.—Tannin, an astringent found in most tree-barks, is used for tanning hides into leather. Some barks are richer in tannin than others. Among those imported into this country are the bark of the hemlock-spruce from the United States, of an acacia from Australia, and of an oak from the Mediterranean, from the east of which region come the acorn-cups known as **valonia**, also used in tanning.

Vegetable dyes have become less important since the introduction of aniliné dyes. Indigo, the most important, is extracted from the stems of a plant of the pea family, cultivated mainly in Bengal, which

supplies most of our indigo. Some is also brought from the West Indies and Central America. Cutch, or catechu, extracted from an acacia, is largely imported from India. Gambier, prepared from the young astringent leaves of a tree growing round the Strait of Malacca, and gamboge, a yellow viscid juice which exudes from the gamboge-tree of Cambodia and is collected in hollow bamboo stems, are imported from the Indo-China peninsula. The finest gamboge comes from Siam. Madder was formerly cultivated for making turkey-red; but alizarin, the colouring matter of this dye, is now obtained from one of the coal-tar products. Many dye-woods, such as logwood, come from Central America.

Of animal dyes, red cochineal is perhaps the most important. It is made from an insect which feeds on the cactus, and is obtained mainly from the Canary Islands. Mineral aniline dyes, made from coal-tar, are imported from Germany.

Timber and Cabinet Woods.—The forests of our country have long been exhausted, and nearly all the timber used in this country is imported.

Redwood and whitewood from the Baltic are used for all kinds of building purposes. The former is also employed in paving streets and for finer kinds of joiner-work, the latter for coarser carpentry. Yellow pine comes from Canada and the northern United States, and the beautifully-marked and resinous pitch-pine from the forests of the east of the Alleghenies. The great Douglas pines of British Columbia and Oregon, and the Californian redwood, are magnificent specimens of timber, being sometimes as much as three hundred feet in height. The former is used for making masts

and as both are free from knots, they are among the most valuable timber imported. Oak is brought both from the continent of Europe and from America, and the hard and durable teak is shipped from India, especially from Burma. Walnut from the south of Europe, the United States, and Canada, and mahogany from tropical America, are employed in high-class joiner-work and cabinet-making. Many other beautiful woods are imported for the latter purpose, mainly from tropical lands—for example, Brazilian rosewood; the satinwoods of the West Indies, southern India, and Ceylon; ebony from Ceylon; and bird's-eye maple from North America.

Much wood is imported in the form of pulp, mainly from Scandinavia and Canada. It is used for paper-making.

The bark of the cork oak, both raw and manufactured, is imported from Spain and Portugal.

Furs and other Animal Products.—Furs are largely imported for winter wear. Siberia, northern Russia, and Canada are the last great fur-preserves of the world. The ermine, fox, beaver, mink, and sable are among the animals hunted for their skins. The seal-fisheries of the Arctic seas employ a large number of vessels, and the skins fetch a high price. The whale-fisheries in the same waters are important for the value of the whalebone and blubber, the latter used for oil. Much of the catch of the Canadian and United States sealing fleets in the North Pacific finds its way to London, which is one of the great fur-markets of the world. The recent development of the bicycling trade has created a great demand for walrus-skins, which make the best

burnishers, and these fisheries will rapidly increase in importance in Arctic waters. The skins of the tiger, lion, leopard, and grizzly bear are prepared as ornamental and useful rugs. By far the largest number of skins and hides brought into this country are those of common animals, such as cattle, sheep, goats, and horses, to be converted into leather. These are chiefly obtained from the pastoral regions of Australia, North and South America, and South Africa.

Elephants' tusks, or ivory, are imported mainly from Africa, at a terrible cost of human life and suffering. The teeth of the hippopotamus and the walrus are also collected for the ivory market.

The feathers of the African ostrich are in great demand, and ostriches are reared now, not merely in South Africa and in Algeria, but also in Australia and Argentina.

The feathers of other birds are also imported for ornament, and those of the domestic fowls and of the eider-duck, the down of which is gathered from the islands of the North Atlantic and from Norway, are brought to stuff cushions, quilts, and other soft and warm articles.

Sponges are brought from the Mediterranean and from the West Indies.

Imported Minerals.

Besides the precious metals—gold, silver, and a small quantity of platinum—the common metals—iron, copper, tin, zinc, mercury, lead, and manganese—are the chief metals imported into the British Isles.

Iron.—Enormous as is the output of iron ore from British mines, it does not suffice for the numerous

furnaces of the United Kingdom, and between 5,500,000 and 6,000,000 tons of ore are annually imported, five-sixths from Spain. The red hematite iron ores of the north of Spain are shipped from Bilbao to South Wales. The black magnetic iron ores of Sweden are still largely used in making cutlery at Sheffield.

Copper.—The development of electrical engineering has led to a great increase in the use of copper, which is found in a pure state in some parts of Russia and near Lake Superior. Over 230,000 tons are annually imported, the greater part either as ore, as partly refined ore known as regulus, or as unwrought blocks. It is sent from the Sierra Morena, in Spain, through Huelva; from the Ookiep mines, in the west of Cape Colony, through Port Nolloth; and from the United States, Australia, Newfoundland, and Chile. Copper-smelting is mainly carried on in South Wales (especially round Swansea), Lancashire, and Lanarkshire.

Lead and Manganese.—Between 170,000 and 200,000 tons of lead are imported annually. Most of the lead is obtained from Spain, Australasia, and the United States, where it is found as a sulphur-lead ore known as galena. Manganese comes from Russia, India, Chile, Brazil, and Turkey, mainly in the form of the black oxide, which is used for making manganese steel. Over 150,000 tons of ore are imported annually.

Zinc.—75,000 tons of crude zinc are annually imported from Belgium, Germany, and the United States; and between 30,000 and 40,000 tons of zinc ore from Italy and Greece, and in growing quantities from Tunis, Spain, and Australia.

Tin.—Over 500,000 cwt. of tin, in addition to 5000 tons of tin ore, are brought, three-quarters of it from

the Malay Peninsula, which supplies most of the world with this metal, through the port of Singapore.

Mercury is largely used for making alloys, called amalgams, and in the refining of gold. Nearly all is derived from Almaden, in the Sierra Morena in Spain. Over 4,000,000 lb. are imported every year.

Many other minerals are imported in smaller quantities, to be used pure or in combination with other metals.

Platinum is obtained from the Ural Mountains. It is not acted on by the atmosphere or any single acid, and it is very ductile and malleable, but not easily melted. It is used in electrical and chemical works.

Nickel, used in making nickel steel, and alloyed with copper to form German or nickel silver, comes mainly from New Caledonia. It is found in the Sudbury mines near Lake Superior, in Canada, and in various parts of the United States, as well as of Europe.

Sulphur, used in making sulphuric acid, is brought from many volcanic regions, more particularly from those of Italy.

Graphite, or plumbago, forms the lead of our pencils, and is also used as a lubricator and polisher. Since the once-famous Cumberland mines were exhausted, it is imported from Ceylon, Germany, and the United States.

Nitrate of Soda, or Chile saltpetre, found in the desert regions of South America, is imported for fertilising purposes. For this purpose many phosphates are brought from the south-eastern United States, but they have to be treated with sulphuric acid before they are used.

The fireproof asbestos is brought from Canada and Italy.

Nearly 200,000,000 gallons of petroleum are brought to this country from the wells at Baku, east of the Caucasus, through the Black Sea ports of Batum and Poti, and from the Pennsylvanian oil-wells in the east of the United States.

Asphalt is obtained from the pitch-lake in Trinidad.

Both silver and gold are largely imported into this country, not merely for coinage, but for use in the arts. Gold is chiefly extracted from the so-called gold quartz. The quartz is first crushed, and then the gold is taken out by chemical or mechanical processes. It is also washed from alluvial sands formed by the decomposition of gold quartz. The west of North America, Australia, and South Africa are the principal sources of the gold imported into this country.

Silver is not usually found pure. Large quantities are obtained from lead-silver ores, in which it is found in small quantities. It is abundant in the Andes, Mexico, Nevada, and Montana in the United States, and in Australia.

Precious Stones.—Diamonds are found in South Africa, especially at Kimberley and in the Transvaal, and also in Brazil. Rubies and sapphires are brought from Burma and Ceylon.

Pearls are the only precious stones of organic origin, with the unimportant exception of coral. They come from the Persian Gulf, Ceylon, the Sulu Archipelago, and the coasts of New Guinea and Northern Australia.

Manufactured Articles Imported.

Many manufactured articles are brought into the United Kingdom in spite of the great activity of its factories. Some of these, such as Turkey carpets or

Sèvres porcelain, are fine articles brought from regions specially famous for their manufacture. Others are common articles which other countries can put cheaply on our market. Many partially manufactured goods, such as cotton, woollen, and linen yarns, are sent to Britain for further elaboration.

A considerable proportion of these imported manufactured articles is immediately reshipped to our colonies and other lands with which we trade.

Cotton piece-goods to the length of over 50,000,000 yards, or 10,000 miles, are brought to this country every year, and over 85,000,000 yards of woollen cloths and stuffs. Many of the imported fabrics are of very fine quality and design. The **woollens** come mainly from France, where the finest qualities are made, and from Germany.

Both woollen and cotton goods are introduced in a further stage of elaboration, as hosiery and other articles of dress.

We spend on an average £4,000,000 per annum on imported manufactured cotton goods, and £9,500,000 on imported manufactured woollens.

Most of the **silk** used in this country is manufactured abroad, in France, Germany, or Italy; and over £16,500,000 are annually paid for manufactured silk brought into this country.

Paris and Berlin supply mantles and many other articles of clothing, the French imports being remarkable for elegance and the German for cheapness.

Nearly £8,000,000 are spent every year on prepared leather, and £500,000 on boots. About 24,000,000 pairs of **gloves** are annually imported from Paris, Grenoble, Brussels, and Copenhagen.

Lace, buttons, studs, and much haberdashery are brought from the Continent.

Many articles of household use are also imported. China, porcelain, and earthenware are brought from the great Continental potteries at Limoges and Sèvres.

Kitchen utensils and tin-plate ware are largely obtained from the United States; cheap cutlery from the same country and from Germany.

Germany supplies many of the chemical manufactures; glass is brought from Germany, Bohemia, and Belgium.

Many scientific instruments are also of German and French manufacture. £1,000,000 are spent annually on musical instruments brought from abroad, chiefly from Germany.

Cheap wooden matches are imported from Sweden, and wax ones from Belgium.

Over £1,000,000 are spent every year on watches, and £500,000 on clocks, of foreign manufacture.

The growth in our imports of manufactured iron is one of the most remarkable phenomena in recent years. In 1898, £7,300,000 were spent on foreign manufactured iron, not much under one-third of the value of our exports. Much of this comes from the United States, Belgium, and Germany.

CHAPTER VIII.

EXPORTS.

Exports and Imports.—The trade relations of this country are very complex. Britain plays the part of a great middleman, acting as an agent between buyers

and sellers in all parts of the world. It trades not merely in its own surplus produce—raw and manufactured—but in almost every article of colonial and foreign produce—raw and manufactured—in which a profitable trade can be done. An immense number of commodities, therefore, are imported only to be re-exported at a profit, chiefly through London. The existence of this entrepôt trade, as it is called, must always be borne in mind in studying lists of our imports and exports.

Home and Foreign Produce.—With the exception of coal, most of our raw exports are first imported. Cotton, wool, the skins of sheep and other animals, tallow and animal fat, india-rubber, and many other forms of raw produce, as well as large quantities of food-stuffs, which are included among our exports, are all of foreign origin. On the other hand, manufactured articles, which figure so largely among our exports, are chiefly, though not exclusively, of home origin.

Mineral Exports—Raw and Manufactured (chiefly of Home Origin).—Coal is by far the most important mineral exported, amounting in value to one-fifteenth of the total exports of the country. Over 37,000,000 tons, or 18 per cent. of the total output of British mines, were exported in 1897, and 36,500,000 tons in 1898. Large quantities are sent to countries bordering the North and Mediterranean Seas, which have little or no coal of their own, such as Scandinavia, Finland, Denmark, Holland, Spain, Portugal, Italy, and Egypt, and to those parts of coal-producing countries, such as Germany, France, and Russia, which are more cheaply reached by boat from Britain than by rail from the

home collieries. Welsh coal is sent all over the world, and supplies the coaling stations for the British navy as well as the vessels themselves.

Between 10,000,000 and 11,000,000 tons of coal are shipped for the use of steamers engaged in the foreign trade, and are not usually reckoned among exports proper.

Iron is exported in many different forms. The quantity of simple pig and puddled iron averages over 1,000,000 tons per annum. Railroad plant of all kinds is sent to nearly all the countries of the world, more particularly to European countries and to the United States. It amounted to 750,000 tons in 1896 and in 1897, but fell to 610,000 tons in 1898.

Tin plates and galvanised iron sheets, which together averaged annually about 500,000 tons during 1896-98, are exported in decreasing quantities, owing to American competition.

Cast and wrought iron, unwrought steel, hoops, sheets, boiler plates, wire, bar, angle, and rod iron, are among the other forms in which this metal is exported, to a weight of little under 1,000,000 tons per annum. Iron is the principal constituent of such exports as cutlery, hardware, and tools, of which more than £3,350,000 worth are annually exported; of cycles, amounting to £1,400,000 in 1897; of locomotives, agricultural and other steam-engines, averaging £3,300,000; of textile, agricultural, and other machines and implements. The total amount of all machinery and millwork exported, including steam-engines, averaged over £17,200,000 between 1896-98.

Among **miscellaneous** exports included under the head of metals, the most important are wrought and

unwrought copper, brass, lead, tin, zinc, telegraph apparatus of all kinds, electroplate, small firearms, guns and ammunition, clocks and watches, and others too numerous to mention.

The total exports of metals and articles manufactured from them, including machinery, were worth over £51,000,000 in 1898, or approximately one-fourth of the total exports of British origin.

Textile Exports (chiefly of Home Manufacture).—Our textile exports are numerous and valuable. Cotton yarns and manufactured goods make up more than one-quarter of the total exports of this country, and woollen yarn and manufactures nearly one-tenth, the exact quantity varying from year to year. Over 5,000,000,000 yards, or 2,750,000 miles, of **cotton piece-goods**, nearly half unbleached, are exported annually to all parts of the world, especially to the hotter regions, such as Mediterranean lands (more particularly Egypt and Turkey), the West Indies, South America, West and Central Africa, India, the East Indies, China, Japan, and Australia, which are our chief customers for these commodities. These cotton piece-goods were worth nearly £48,000,000 in 1898. If the cotton yarn, exported mainly to European countries (Germany, Holland, Turkey), British India, and Japan, be added, the total cotton manufactures we export are valued at over £66,000,000 on the average of the three years 1896–98 (£65,000,000 in 1898).

About 100,000 miles of **woollen and worsted goods**, over 10,000,000 yards of flannel, and 1,000,000 pairs of blankets are exported annually. The woollen trade is mainly with the cooler countries of the world, more particularly with European countries (especially

France, Belgium, and Germany), the United States and Canada, Australasia, Argentina, and Japan.

The hostile tariff of the United States has lately diminished the export of woollen goods to that country. Woollen and worsted tissues exported to the United States in 1896 were worth nearly £3,500,000; in 1898 a little over £1,000,000. The total woollen manufactures of all kinds, including yarns, exported in 1898 were worth £18,300,000—£5,600,000 less than in 1896.

Approximately, 100,000 miles of **linen** goods are exported, composed chiefly of white or plain linen. About 3 per cent. consists of sailcloth and sails.

The chief markets for linen goods are the United States (which takes about half of the total), Australia, Germany, Canada, and France. The total value of linen goods exported was nearly £4,400,000 in 1898.

Between 4000 and 5000 miles of **silk** are annually exported. Twist or yarn goes chiefly to the United States, Germany, and France; broadstuffs of silk or satin to France; handkerchiefs and shawls to India. The United States and our colonies receive all kinds of silk goods. The total exports are worth about £1,500,000.

Over 130,000 miles of **jute** piece-goods are exported to the United States, Argentina, Canada, and other countries. Two-fifths of the jute yarn exported is sent to Brazil. Jute articles, excluding bags, were exported to the extent of £2,350,000 in 1896 and £1,850,000 in 1898.

A large number of **miscellaneous** textile articles are exported, including cotton and linen thread for sewing purposes, lace, hosiery, carpets of wool and jute, and many others.

The total value of the textile articles exported was £105,300,000 in 1896, £96,600,000 in 1897, and £94,500,000 in 1898.

Miscellaneous Manufactured Articles (chiefly of Home Manufacture).—A large trade is done in chemical products (alkalies, bleaching materials, manures, and medicines), amounting to about £4,500,000 per annum. Cements and glass, pottery, paper, painters' colours, oil and floor cloth amount to other £7,500,000.

Rubber goods worth £1,300,000 are annually exported. Leather, both unwrought and wrought (more particularly in the form of boots, shoes, and saddlery), furniture, haberdashery, millinery, books, and many other articles are sent abroad in large quantities.

Raw Produce for Manufactures (chiefly of Foreign Origin).—In addition to coal, iron, and other ores, which have already been mentioned, a large export trade is done in textile raw materials. Of these, **wool** in all its forms, is by far the most considerable, averaging in value £15,000,000. From 4,000,000 to 5,000,000 sheepskins and about 3,000,000 cwt. of wool are exported annually, chiefly to France, Germany, the United States, and Belgium. Imported **cotton** (nearly 2,000,000 cwt.), dressed and undressed **flax**, and **hemp** are also exported in large quantities. **Caoutchouc** and **guttapercha** have grown in recent years to be among the chief articles of our entrepôt trade, amounting to over £4,000,000 worth in 1898.

Food Exports (chiefly of Home Origin).—The export of **fish**—one of the few natural products which this country exports—is very large. Nearly 1,750,000 barrels of herrings alone were sent abroad in 1898,

worth £1,900,000. Our largest customers for fish are those countries where the use of flesh is forbidden on religious grounds at certain seasons, such as Germany, Russia, and the Roman Catholic countries bordering the Mediterranean.

Live-stock is in considerable demand abroad, chiefly for breeding purposes. Of live-stock used for food, sheep are the most important; but the number exported is less than that of horses, which are largely exported to Belgium, Holland, France, and Germany.

Of **vegetable** home-grown exports, the potato is the most important, the quantity exported varying from year to year with the size of the crop. In 1898 only about 194,000 cwt. were exported and in 1894, 1,073,000 cwt.

Our food exports include colonial produce of all kinds; cereals, such as maize, wheat, wheat-flour, and barley, to which may be added 250,000 cwt. of biscuits and bread, and a like quantity of seeds of all sorts; foreign beef and pork; dairy produce and eggs. Colonial produce is the most important.

CHAPTER IX.

THE GREAT TRADE-ROUTES FROM THE BRITISH ISLES.*

FOR an island country, such as Britain, transport by sea is all-important, bringing it into contact with all the maritime countries of the world. We have seen that much of our raw material and food is imported, and that we are dependent upon foreign

* See map on page 133.

markets for the sale of our surplus manufactures. It is, therefore, important to understand the main sea-routes and the principal commodities carried over them.

The North Sea and Baltic Trade.

When population and manufactures were concentrated in the south-east of Great Britain, the greater part of our trade was with the ports on the opposite side of the English Channel and the North Sea, more particularly between the Thames and the Rhine ports. In modern times the North Sea trade is still very valuable; it is carried on from all the east coast ports, more particularly from London, Harwich, Grimsby, Hull, the north of England ports, and from those of the Forth. The **North Sea trade** may be divided into two kinds, the mainland and the Scandinavian trade. The mainland trade is with France, Belgium, Holland, and Germany; the chief ports being Dunkirk (Dunkerque) in France, Antwerp (Anvers) in Belgium, Rotterdam and Amsterdam in Holland, Bremen and Hamburg in Germany—much of whose trade also goes through Holland and Belgium. The Scandinavian trade is largely with Bergen, Kristiansund, Kristiania, and Drammen. The chief exports to the mainland are cotton and woollen yarn and manufactures, coal, metals, and machinery—the Humber ports doing the largest trade.

From Belgium we receive cotton, silk, woollen, and linen goods greater in value than our exports to these countries; also flax, glass, iron, zinc, sugar (both refined and unrefined), eggs, and dairy produce. From Holland we obtain butter, margarine, cheese, fresh and preserved meat (especially mutton), sugar, and colonial

produce, such as cacao and rice. We import much German, Austrian, and Swiss produce through Holland and Belgium, notably silk, sugar, clocks and watches, glass, gloves, wine, condensed milk, toys, and aniline dyes.

To Norway the chief exports are cotton, woollen, and metal manufactures, and coal, in return for which we obtain timber, wood-pulp, paper, fish, ice, and condensed milk.

A large passenger trade is carried on from Harwich to the Hook of Holland (Hoek van Holland), Rotterdam, and Antwerp; from Queenborough to Flushing (Vlissingen); from Dover to Ostend; and in the summer months also from Tilbury to Ostend.

The **Baltic trade** is with regions having large areas of forest and agricultural land, but little coal or other minerals, except the iron of Sweden.

Navigation is interrupted from three to five months every winter, owing to many of the harbours being ice-bound. The waters of the Baltic are only one-quarter as salt as those of the ocean, and freeze more easily, although the whole sea is but rarely completely covered with ice. The use of ice-breaking steamers in recent years has helped to keep the Baltic navigable. Several canals unite the North and Baltic Seas. By far the most important is the Kaiser Wilhelm Canal between Brunsbüttel, near the mouth of the Elbe, and Holtenau, near Kiel, which is large enough to admit ships of all sizes. This canal saves about 240 miles (twenty hours) on the journey from London to Baltic ports other than Danish, 180 miles (fifteen hours) from the Humber, and over 100 miles (nine hours) from the Tyne ports. From the Forth, the old route by

the Skager-Rak and the Kattegat is as short, but its navigation is much more dangerous. Copenhagen (Kjöbenhavn) on the Sound, is the great commercial centre of the Baltic trade. Coal, metal, and manufactured goods of all kinds are sent thither, and Danish butter, bacon, and eggs are shipped to Britain.

Coal, metals, textile fabrics, and machinery are the chief products sent to the Baltic ports, the cold climate creating a greater demand for woollen than for cotton fabrics. In return we obtain timber, wood-pulp, iron, butter, paper, and matches from Sweden through the ports of Göteborg (usually written in English, Gothenburg), Malmö, Norrköping, and Stockholm. Timber, cereals, flax, hemp, linseed, oil-seed cake, and butter are imported from Russia through St Petersburg, Riga, and Revel. From Germany, through Memel, Königsberg, Stettin (with Swinemünde as its deep-water harbour), and Kiel, we get timber, butter, and some manufactured and chemical goods; but most of these pass through the North Sea ports.

The European Atlantic Trade.

A very large proportion of British trade between the British Isles and the Continent is carried on across the **English Channel**, between Dover and Calais, Folkestone and Boulogne, Newhaven and Dieppe, Southampton and Le Havre, Weymouth and St Malo. A large part of the trade between London and Paris is carried on by direct shipment from London to Le Havre or Rouen on the Seine, and steamers regularly ply between London and Paris. A considerable trade is also carried on between the coalfields of South Wales and the north of England

and the ports in the north of France. The latter also trade with Liverpool.

Trade with the Bay of Biscay and the coast of Portugal and Spain is actively carried on through all west coast ports, more particularly between Liverpool and Bordeaux. Bilbao, Santander, and other ports in the north of Spain send unsmelted and partially smelted ores to the South Wales and Lancashire furnaces. The clarets of Bordeaux are shipped direct to London, Leith, and Liverpool. From Oporto and Cadiz respectively come port and sherry wines; from Lisbon, olives, oranges, and other fruits; from Huelva and Cadiz, copper, manganese, and other minerals from the Sierra Morena, as well as cork, fruit, and other products of Andalusia. Coal, metals, and manufactured cottons are sent in exchange, chiefly from Liverpool, London, and the coal exporting ports of northern England and Scotland.

The Mediterranean Trade.

The Mediterranean, like the Baltic, is a sea with few coalfields near it, those of the south of France being comparatively unimportant. The forests of the Mediterranean have been nearly all cleared, so that wood is not available for fuel as in the case of the Baltic. Consequently a large trade in coal is done with the Mediterranean ports, chiefly for industry and transport, as the southern climate greatly reduces the domestic consumption.

The Mediterranean is not the seat of very great industrial activity save in the valleys of the Ebro, Rhone, and Po, and manufactured goods, more particularly cottons, linens, and light woollens, are among

the articles chiefly in demand. In exchange for these commodities, our ships bring back subtropical fruits—oranges, lemons, figs, olives, grapes, and also dates from the borders of the desert. Minerals are almost entirely obtained from the south of Spain. A large trade in cereals passes through the Mediterranean from the Black Sea ports.

To protect our commerce in the Mediterranean and to guard the route to India, Britain possesses three stations in the Mediterranean: Gibraltar, on the Spanish mainland in the west, guarding the strait of that name; the island of Malta, commanding the passage between Sicily and Africa; and Cyprus, protecting the eastern Mediterranean. Since 1882 Egypt has been under British control. This is jealously viewed by our Continental neighbours, owing to the importance of the Suez Canal as an international highway.

Spanish Trade.—From Malaga, Almeria, Cartagena, and Valencia in the south of Spain, grapes, raisins, wines, oranges, lemons, almonds, and copper, mercury, and other minerals from the Sierra Morena, are sent to this country, which in return exports coal, metal goods, and textile manufactures. Barcelona, to the north of the mouth of the Ebro, is the port for the rich lands of Catalonia, carrying on a trade with Britain similar to the southern ports.

French Trade.—Cette, in the south of France, is the great wine port of the Mediterranean. Marseilles is the commercial outlet for Provence and the Rhone valley. It lies east of the Rhone delta, the shallow distributaries of that river not being navigable for large vessels. Wine and olive-oil are exported to

this country, coal and metal goods being taken in return.

Italian Trade.—Genoa (Genova), Leghorn (Livorno), and Naples (Napoli) receive large quantities of coal from South Wales, Newcastle, and Scotland; fish from Scotland and from the south-west of England; engines, railway plant, and metallic goods. Through Genoa itself we import little, our trading-vessels going farther east for their return cargo, to the Levant, to the Ægean and Black Seas, or to Algiers. The transporting of coal and other commodities from Britain is passing into the hands of Italian shippers. From Naples olive-oil, marble, wine, hides, and hemp are obtained in return. A considerable trade is done with the ports of southern Italy, more particularly with Palermo and Messina, which take cotton, woollen, and metallic manufactures, and coal, in exchange for wine, oil, southern fruits, and sulphur.

Adriatic Trade.—From Venice (Venezia), the centre of a considerable Adriatic trade, our ships bring back little, usually leaving the harbour loaded with ballast, to take in wheat, flour, and wine at Trieste and Fiume, the ports of Austria and Hungary respectively.

Greek Trade.—Valonia and currants are the chief exports of Patras and Piræus, which receive industrial produce in exchange. The Corinth Canal, across the isthmus of that name, saves the long journey round the south of the Morea. Syra, or Hermopolis, is the coaling station and chief port of the Grecian Archipelago, and exports emery and iron ore.

Turkish Trade.—From Salonica (Slavonic, Saloniki; Turkish, Selanik) cereals, tobacco, wool, and opium

are obtained. Constantinople (Turkish, Stambul), on the Golden Horn, is one of the most important commercial cities in the world. Lying between the Black Sea and the Mediterranean, and between Europe and Asia, it is the market through which the products of two seas and two continents are exchanged. Manufactured goods of all kinds are sent out from Britain in vessels which return with Turkey carpets made by Armenians, mohair, wool, and opium.

Danube Trade.—From the Danube ports, more particularly Sulina, Galatz, Braila (or Ibraila), and Varna, the cereals of the Hungarian and Wallachian plains are shipped.

Russian Black Sea Trade.—Cereals and flour are the chief products obtained from Odessa, Kherson, and Taganrog, the principal ports of southern Russia. From Batum, in the east of the Black Sea, petroleum-oil from Baku in the eastern Caucasus is exported.

Asia Minor Trade.—Trebizond distributes most of the imports intended for Asia Minor and Persia, and collects much Persian produce, more particularly silk and woollen, for export to this country.

Smyrna, the great port of Asia Minor, receives from this country manufactured articles of all kinds—metal and textile, chemical and leather. Sultana raisins, barley, beans, figs, olive-oil, valonia, gall-apples, drugs, cotton- and other seeds, and tobacco are among the most important exports.

Syrian Trade.—Beirut (Beyrouth) and Jaffa, the chief ports of Syria, send wool to America by Liverpool; but the chief trade is in fruit.

Egyptian Trade.—From Alexandria the products of Egypt—cotton, cotton-seeds, sugar, beans, onions,

cigarettes—together with gums and ivory from the Sahara and the Sudan, are shipped.

North African Trade.—Bengazi and Tripoli trade in gums and other products, brought across the desert, and, in common with Tunis, Algiers (Alger), and other ports in northern French Africa, export esparto grass (for making paper) and barley. Algiers also exports iron ore. In return we send coal, cottons, and metal goods.

Extra-European Atlantic Trade.

The Atlantic trade may be divided into the North American trade, the trade with Central America and the West Indies, the Guiana and Brazilian trade, the Plate trade, the West African trade, and the South African trade.

The **North American Atlantic trade** is of great importance to Britain. Not merely do we get the greater part of our food-supply from the United States and Canada, but a very large proportion of our manufactured goods are sent to these countries. The St Lawrence ports, Quebec and Montreal, are closed in winter by ice, and the traffic is then diverted to Halifax, St John, Portland (Maine), Boston, and New York. With the last two ports, together with Philadelphia and Baltimore, a very large proportion of our trade with the United States is carried on. From Halifax and St John, cereals, flour, cattle, meat, timber, cheese and other dairy produce; and from the United States ports, iron goods in addition, are sent in return for every kind of manufactured article. High tariffs and the steady development of American industries are tending to reduce the importance of our exports to

the United States, while the preferential tariff granted by Canada to the mother-country serves to foster our trade with that colony. Wilmington, Charleston, and Savannah send us sea-island cotton, as well as pitch-pine, turpentine, and resins from the forests of the southern Appalachians. Pensacola, Mobile, New Orleans, and Galveston are the chief ports on the Gulf of Mexico, from which we obtain raw cotton, cotton seeds and oil, tobacco, wheat and meal, sent down the Mississippi to New Orleans.

Central American Trade.—Manufactured goods are the chief exports to Vera Cruz, the principal port of Mexico, from which metals (more particularly silver), mahogany, and cigars are brought. Belize, in British Honduras, and Bluefields, in Nicaragua, export mahogany and other fine woods from the wet and densely-forested eastern regions of Central America; but most of the trade of this region is carried on from the Pacific ports which are on the side of the isthmus best situated for agriculture and trade. When the Nicaragua or Panama Canal is cut these ports will be brought much nearer Britain.

West Indian Trade.—The West Indies exchange sugar and tropical fruits for manufactured goods of all kinds. From Havana, in Cuba, we get tobacco and cigars; sugar, molasses, and rum from Kingstown in Jamaica; cacao from Port of Spain, which also exports the asphalt of the Trinidad pitch lake. Barbadoes is the British shipping centre for the Lesser Antilles.

The Guiana and Brazil Trades.—From La Guaira, the port of Caracas, the capital of Venezuela, and the other ports in the north of South America cacao is the chief export. Sugar is principally brought from George-

town, on the Demerara River in British Guiana. Cacao is also shipped from the north of Brazil; but the chief trade of that district is in india-rubber, which is shipped from Pará, at the mouth of the Amazon. It is also shipped from Manaos (situated where the Rio Negro joins the Amazon), Pernambuco, and Bahia, the latter the second port in Brazil. These ports also send coffee, sugar, cotton, rosewood, hides, and diamonds. The great centre of Brazilian trade is Rio de Janeiro, from which all these articles are exported. Santos, farther south, is the outlet for the rich coffee district of São Paulo.

The Plate Trade.—Monte Video and Buenos Ayres are the chief ports on the Plate estuary, from which wheat, maize, and other cereals, cattle, sheep, wool, and hides from the Plate basin, are exported in return for coal, chemicals, textile and metal goods.

The West African trade is almost entirely in cotton and metal goods and spirits, the latter usually of the vilest description. These are sent to Freetown, Akra, Lagos, Akassa, Bonny, and other ports on the Gulf of Guinea, from which india-rubber, palm-oil, oil-yielding nuts, and ivory are exported. Most of these are obtained at great cost of life, both in the collection of the produce and its transport to the coast.

To South Africa we send out clothing of all kinds, metal goods, machinery, leather, cotton and woollen goods, paper and stationery, furniture, carriages, and in fact all manufactured articles required either for domestic or industrial purposes. In return we obtain diamonds, gold, copper, wool and skins (both of the sheep and the angora goat), hides, and ostrich feathers. Capetown, Port Elizabeth on Algoa Bay, East London,

Durban on Port Natal, and Lourenço Marques on Delagoa Bay are the chief ports for the trade of the British and Boer states of South Africa.

Indian Ocean Trade.

The trade of the Indian Ocean was formerly carried on round the Cape of Good Hope; but since the opening of the Suez Canal the shorter route is generally taken by steamers. The trade carried on across the Indian Ocean may be divided into East African, Arabian, Persian, and the Indian and Ceylon trade.

The **East African trade** is still carried on by both routes. The principal southern ports have been already dealt with. Zanzibar is the great trade-centre of East Africa. From the island itself the chief export is cloves; but much of the ivory and rubber brought from the interior to Vitu, Mombasa, and Dar-es-Salaam is sent to Zanzibar, which also forwards British goods to these ports for distribution in the interior. A considerable trade is carried on at the mouth of the Zambesi with the Shiré Highlands, part of the British Central Africa Protectorate, where coffee has been most satisfactorily cultivated in recent years, and rice, tobacco, cotton, and tea successfully grown. Trade with Madagascar has diminished since the island became a French possession. From Mauritius, the Seychelles, and other islands sugar is the chief export.

The **Arabian trade** is mainly in gums. These are exported through Jeddah and Aden (the latter a British possession guarding the entrance to the Red Sea). Wool, carpets, hides, dates, shells, opium, and gums are among the chief articles exported from the **Persian Gulf**, mainly through Bushire, on the coast and Basra,

in Mesopotamia. Dates, gums, and a small quantity of goats' and camels' hair come from the Arabian steppes through Persian Gulf ports.

Indian and Ceylon Trade.—India is a very important market for our manufactures, sending us in return both raw materials and manufactured articles of every kind.

Karachi, the port of the Indus, exports wheat, oil-seeds, wool, cotton, and hides; and imports large quantities of railway plant for the rapidly increasing network of lines.

Cotton and cotton yarn, oil and oil-seeds, wheat and other cereals, opium, leather, gums, and tea are sent to this country from Bombay. In return it takes chiefly cotton goods and machinery, railway plant, metal goods of every kind, and manufactured articles for distribution to western and central India.

From Colombo, in Ceylon, are brought all kinds of tropical products, more particularly tea, cacao, quinine, spices such as cinnamon, coco-nuts and copra, areca-nut, tobacco, and vegetable ivory. The export of coffee, formerly very important, has declined owing to the destruction of the plants by disease.

Madras does a large export trade in raw cotton, coffee, seeds, indigo, leather, Palmyra palm sugar for brewing and for fattening cattle, oil, coco-nuts, copra, tobacco, and hides, especially goatskins.

Much of our Indian trade passes through Calcutta. Jute is exported to Dundee both from this port and from Chittagong in sailing-vessels, which double the Cape of Good Hope. Tea, rice, wheat, indigo, some rubber, raw hides of cattle and goats, gunny sacks, and linseed are other important articles brought from Calcutta to this country.

Rangoon distributes the produce of Burma, including rice (which is by far the most important), cutch, teak, and precious stones such as the ruby.

Pacific Trade.

There are three routes from the British Isles to the Pacific Ocean: by the Suez Canal and the Indian Ocean, by the Cape of Good Hope and the Indian Ocean, and by Cape Horn. A canal across the South American peninsula, either at Panama or Nicaragua, would greatly shorten the distance to many Pacific ports, more particularly to those on the west coast of America. It has also been proposed to avoid the long journey round the south of the Malay Peninsula by cutting a canal across the isthmus of Kra.

The Pacific trade may be divided into the East Indian trade, the China and Japan trade, the North American trade, the tropical American trade, the South American trade, and the Australian trade.

The **East Indian trade** resembles the West Indian in many respects. The intertropical islands of eastern Asia are rich in forest products, yielding fancy timbers and dye-woods, juices such as guttapercha, and fibres such as Manila hemp. Tin, spices, sago, sugar, guttapercha, rubber, cutch, gambier, and fruits are exchanged for cotton goods and hardware.

Singapore, on an island of the same name at the southern end of the Malay Peninsula, is the natural centre for the western ports of the East Indies, and a port of call for ships passing through the Strait of Malacca. Local trade is mainly in the tin of the Malay Peninsula; but all East Indian products are brought to Singapore for transhipment.

Batavia, on the island of Java, occupies a similar position with regard to the southern part of the group in the Sunda Strait. It is the capital of the Dutch East Indies, the rich produce of which is brought to Batavia for shipment to Europe. Amboina, in the Moluccas, is the centre of the spice islands.

Manila, on Luzon, the largest of the Philippines, is the northern centre of the East Indies. Under United States control it will grow rapidly in commercial importance, as ships sailing to the China Sea will seek the shelter of Luzon during the North-east Trades, while it also lies on the direct route between Hong-kong and Australia. Sugar, cheroots, and Manila hemp are the chief articles exported from the Philippines, in addition to ordinary East India produce; but the resources of these valuable islands are still practically undeveloped.

From Bangkok and Siam ships bring back teak, rice, and tin.

China and Japan Trade.—The populous countries of eastern Asia are excellent customers, taking more particularly large quantities of cotton goods and hardware.

The trade of China should develop considerably with the opening up of the country by railways and the use of steamers on the Yang-tse-kiang and other navigable waterways. China will be a customer not merely for the cottons and hardware which form the bulk of the trade at present, but a great importing centre for railway plant, machinery, and metal manufactures of all kinds, to be utilised in the building of new railways and factories.

Hong-kong, a British island at the mouth of the

Si-kiang, in close communication with Canton, the great southern port of China, is the outlet through which about 45 per cent. of the foreign trade of China is carried on. From Hong-kong and Canton the tea and silks of southern China are largely exported.

There are many ports on the rocky eastern coast of China south of the Yang-tse-kiang, such as Amoy, Fuchau, and Hangchau; but the bulk of the trade of China passes through the port of Shanghai, near the mouth of that river. Shanghai is the great importing centre of central China, and does a large export trade in tea and silk.

There are several ports on the Yang-tse-kiang, of which Hankau (= Hanmouth) at the mouth of the Han River, a tributary of the Yang-tse-kiang, is the most important, although river steamers proceed as high as Ichang, one thousand miles from the sea.

The trade of northern China passes mainly through the port of Tientsin, on the Gulf of Pechili; that of Manchuria through Niuchwang, on the Liautung Gulf. These gulfs are frozen in winter; but during the other months a vigorous trade goes on, more particularly from Tientsin, which is the port of Peking, the capital. Exports from this region are comparatively unimportant.

Silk, silk goods, and straw plait are our chief imports from Japanese ports. Copper, rice, carpets, lacquer ware, china, and beautiful fabrics are among the other goods exchanged for the cottons, woollens, metals, machinery, steamships, engines, and implements of all kinds sent from this country. The chief ports are Nagasaki, on the island of Kiushiu, and Yokohama,

the port of the capital, Tokyo, on the main island, Honshiu or Nippon.

North American Pacific Trade.—From Vancouver, and the towns of the Canadian Pacific Railway, and Victoria, on Vancouver Island, passengers and mails are conveyed to and from the Far East of the Old World, Australia, and New Zealand. The amount of direct oceanic communication with the British Isles is not very great. Manufactured articles are carried out in vessels which bring back timber from British Columbia, Tacoma, and Seattle, on Puget Sound, and Portland (Oregon), from which, as well as from British Columbia, canned salmon are largely obtained. Portland is also a grain port; but most of the wheat raised in western America is exported through San Francisco, which also exports gold and silver. In recent years the fruits, wines, fish, fresh and dried meat, of the rich Californian valley have been largely exported from San Francisco, and from Los Angelos in the south, to which ports clothing, metallic and textile goods, and sacks to hold grain, are consigned from this country.

Tropical American Pacific Trade.—Coffee and cacao are the most important exports from the Pacific ports in tropical America. Coffee is brought from Puntarenas, in Costa Rica. Guayaquil, the port of Ecuador, exports more cacao than any other port in the world.

South American Pacific Trade.—The dry regions of Peru and Bolivia furnish guano, cinchona (quinine), sugar, raw cotton, and india-rubber, while alpaca wool and silver come from the mountains, and vanilla from the wetter eastern sides. The chief harbours for imports are Callao, close to Lima (the capital), and

Molendo, from both of which railways ascend the Andes. Antofagasta, the chief port of northern Chile, is connected with the plateau of Bolivia by a railway, which brings down silver, copper, tin, cinchona, and other products of that country, as well as nitrate of soda from the Atacama desert, across which it passes.

Valparaiso, the port of Santiago (the capital), is the chief harbour of Chile. Cotton, mixed cotton and woollen goods, iron, ironware, and machinery are the chief articles taken out by our ships in exchange for the wheat, copper, wool, and guano shipped at these ports.

Australian Trade.—Australia is reached from Britain both by the Suez Canal and by Cape Horn. Mails and passengers from this country can also proceed to Australia and New Zealand by the Transatlantic lines to Montreal and New York, by rail to Vancouver and San Francisco, and thence by steamer across the Pacific. The exports from this country are chiefly manufactured goods, which are exchanged for wool, flesh, hides, southern fruits, butter, tallow, leather, gold, copper, and lead.

Albany, on George Sound, in the south of **Western Australia**, is the first port touched by vessels from western Europe, and here West Australian gold, wool, and hardwood timber are shipped. A considerable trade is done from Fremantle, the port of Perth (the capital), at which, however, mail steamers do not call.

Port Adelaide, or Glenelg, both ports and suburbs of Adelaide, the capital of **South Australia**, is the next port touched at. Here wool, lead, copper, gold, silver,

wine, and skins are shipped in return for textiles, cotton and woollen clothing, shoes, iron, railway plant, hardware, tobacco, beer, and spirits.

Melbourne, on Port Phillip, is the chief town of Victoria. The goods imported from Britain are the same as in the case of Adelaide, but on a larger scale. Wool, butter, gold, and copper are the most important articles we take in return; but tallow and unworked leather are of considerable importance. Frozen and preserved meats and a little wheat are also sent to Britain.

Sydney, on Port Jackson, the capital of New South Wales, does a very large trade. Gold, silver, and wool are more, dairy produce less, important than in the case of Victoria, and a considerable quantity of meat, leather, tallow, hides, copper, and lead is exported.

In Queensland there are several ports to which we ship the same commodities as to the other Australian ports. The cargoes brought back differ considerably. Brisbane, in the south, is the capital, and the most important port. Here wool, hides, tallow, flesh, and preserved meat are still among the principal exports. Gold and shells are also important. From Rockhampton, Mackay, and Townsville railways run far into the interior. Townsville receives much gold from the Charters Towers mines. Wool becomes less important in the far north, and is replaced by tropical products.

Tasmania (capital, Hobart) has also a large wool trade, and Tasmanian fruits, more particularly apples, are becoming known in British markets.

New Zealand.—Auckland and Wellington are the

busiest ports in North Island ; Lyttleton and Dunedin in Middle Island. Wool, meat, dairy produce, tallow, sheepskins, and Kauri gum are the chief exports. Kauri gum is obtained principally from North Island. The sheep of the Canterbury Downs in the Middle Island yield exceptionally fine mutton. Leather is also exported, as well as gold and silver.

CHAPTER X.

THE TRADE OF THE UNITED KINGDOM.

THE trade of the British Isles has passed through three stages. In the first, or primitive stage, which is of great antiquity, minerals, more particularly the tin of Cornwall, attracted traders from the Mediterranean. In the second, or mediæval stage, organic raw products, more particularly wool and hides, were exchanged for manufactured goods and articles of luxury. In the third, or modern stage, the process is to a large extent reversed, and manufactured goods have become the commodities chiefly offered in exchange for food, raw materials, and luxuries.

The trade of the United Kingdom has trebled itself during the last forty years. During the five years 1855-59 the average value of the imports was £169,000,000, and of the exports £116,000,000—making an average total trade of £285,000,000. Forty years later, during the four years 1895-98, the average value of the imports was £445,000,000, and of the exports £292,000,000—making an average total trade of £737,000,000, or, approximately,

three times as much as between 1855 and 1859. The increase has been especially great during recent years. In 1895 the imports were valued at £417,000,000; in 1898 they had increased to £470,000,000, an increase of £53,000,000 in four years. The exports have risen from £286,000,000 in 1895 to £294,000,000 in 1898, and the total trade from £703,000,000 in 1895 to £764,000,000 in 1898—making an increase of £8,000,000 in the exports and of £61,000,000 in the total trade within four years.

In the imports the increase has been general. In the exports an increase has taken place in the case of most commodities, more particularly under the heads of machinery, textile fabrics, metals, and raw materials, more especially coal. During 1898, however, there was a decrease in textile exports and in metallic exports, with the exception of machinery.

The tonnage of trading vessels engaged in foreign trade which entered the ports of the United Kingdom in 1898 amounted to more than thirty-four million tons, and nearly forty million tons of shipping left its ports during the same period. The coastal trade is almost as great.

Over one-fifth of the imports come from British possessions, and one-third of the exports are sent to them. By far the most important part of our import trade is with the United States, amounting to one-quarter of the whole. One-ninth of our imports come from France; over 6 per cent. from Australasia, the Netherlands,* and the German Empire respec-

* It must be noted that the trade of central Europe passing through Belgian and Dutch ports is reckoned as trade with Belgium and the Netherlands.

tively; nearly 6 per cent. from British India; and over 4 per cent. from Russia, Belgium, and British North America respectively.

The German Empire takes over 11 per cent. of our exports of all kinds, a larger proportion than any other country. It is followed by British India, over 10 per cent., and by the United States, nearly 10 per cent.; Australasia accounts for 8 per cent.; France for 7 per cent.; the Cape of Good Hope and Natal together for 5 per cent.; Belgium, the Netherlands, and Russia each for from 4 to 5 per cent.; British North America for $2\frac{1}{2}$ per cent.; while Italy, Turkey, Argentina, Brazil, Sweden, China, and Japan each take about 2 per cent. of our exports.

It will thus be seen that our largest trade is with the United States, which is not only one of our best customers, but at the same time the source from which we derive most of our food products and raw materials, including a large proportion of all the wheat we consume and all the cotton we manufacture. Yet we import four and a-half times as much from it as we export to it. Next comes British India, to which we send manufactured cotton, and from which we obtain wheat, raw cotton, and many other natural products. Our trade with Continental countries is in the following order: France, Germany, Holland, Belgium, Russia.

About one-sixth of the trade of the United Kingdom is an entrepôt trade—that is, a trade in commodities imported for re-exportation. There is too little trade between many foreign countries to permit of a direct exchange of commodities between them. In such cases it is generally cheaper to use London as an

entrepôt to which cargoes from various countries are consigned in vessels which reload in London with suitable cargoes.

Commercial Advantages and Disadvantages of the British Isles.—It has already been pointed out that the distribution of high and low land in the British Isles makes communication easy, except in the Highlands of Scotland. The productive centres are either near the coast or connected with it by navigable rivers whose great tidal estuaries admit ships of large tonnage to safe harbours. On the west coast of Great Britain, where most of the rivers are shorter, good natural harbours are numerous. Coastal navigation can be carried on uninterruptedly at all seasons. The British Isles are favourably situated for foreign trade. They lie facing two of the wealthiest continents, Europe and North America, and almost in the centre of the land hemisphere.

The climate is everywhere temperate, permitting work to be carried on all the year through. The humidity is sufficiently varied to permit of every kind of pastoral and agricultural occupation, as well as the most delicate textile operations, being successfully carried on.

The abundance of coal and iron has contributed to the pre-eminence of the United Kingdom in the modern industrial world. These minerals occur together near lime and clay, affording great advantages for iron manufacture. Shipbuilding naturally developed in the iron centres near the coast, and the British are still the greatest ocean carriers.

Besides these natural advantages, Britain has had the good fortune to waste little money in war for

many decades, nor are its working-men obliged to render compulsory military service, and thus, from an industrial point of view, waste three of their best years. Free-trade admits cheap food and raw materials from all parts of the world, and, before other nations began to compete, led to rapid industrial expansion. Home agriculture, however, was less favourably affected, and, owing to foreign competition, is not so flourishing as it should be.

Among the hindrances to ~~our~~ ^{their} prosperity are heavy rents for land, high royalties on mines, and high transport rates, all adding to the cost of commodities. Still more serious drawbacks are our present educational system, which permits children to leave school too early, and a widely diffused indifference to education among the classes most in need of it. Agricultural depression, it has been said, is partly mental depression ; and this is true of more than agriculture.

Much more might be made of ~~our~~ ^{their} present resources. The problem of inland waterways must be seriously faced. Navigable rivers and canals all require to be widened and deepened. Almost unlimited water-power is available in mountainous regions for industrial purposes, while winds, and in many places tides, could also be subjugated to ~~our~~ ^{their} needs.

Most extravagant of all is the incalculable waste of human capacity, which can only be remedied by a training which develops to the full the diverse capabilities of each individual, and inculcates in him an intelligent and sympathetic appreciation of the importance and utility of his work.

FISHERIES, MEAN ANNUAL YIELD, 1896-98.*

England and Wales.....	393,000	tons, worth £5,497,000
Scotland.....	295,000	" " 1,691,000
Ireland	43,000	" " 284,000
<hr/>		
Total.....	731,000	" " £7,472,000
<hr/>		
And including shellfish.....		7,947,000

N.B.—Salmon are not included in this return.

METALS EXTRACTED, 1897.*

METALLIC MINERALS.	Minerals	Values	Metals	Values of
	raised.		contained in the ores.	
	1000 tons.	£1000.	1000 tons.	£1000.
Iron ore and pyrites.....	13,798	3,222	4,737	11,395
Lead ore.....	35	275	27	333
Tin ore	7	254	4	291
Zinc ore	19	69	7	127
Copper ore.....	7	19	.5	27
Value of chief metallic minerals		£3,853,389		
Total value of metals from British ores		12,268,091		

NON-METALLIC MINERALS EXTRACTED, 1897.*

MINERALS.	1000	Value	MINERALS.	1000	Value
	tons.	£1000.		tons.	£1000.
Coal	202,130	59,740	Gravel, sand.....	1,357	111
Clays	12,705	1,453	Gypsum.....	181	67
Sandstone.....	4,964	1,525	Arsenic and ars.		
Slates, slabs...	609	1,649	pyrites.....	17	85
Limestone....	11,004	1,156	Barytes	23	24
Salt.....	1,903	621	Ochre, &c.....	14	13
Oil-shale	2,224	556	Others.....	119	34
Granite.....	1,847	552	Total.....		£68,190
Basalt, &c.	2,356	441			
Chalk.....	3,858	163			

Mean Annual Value 1896-98, £69,774,000.

* From *Statesman's Year Book*, 1899.

COAL PRODUCTION, 1897.*

DISTRICT.	1000 tons of coal.	DISTRICT.	1000 tons of coal.	
ENGLAND—			England (continued)—	
Durham	33,819		Other districts	10,657
Yorkshire.....	24,055	WALES—		
Lancashire	22,813		Glamorgan	25,113
Staffordshire.....	13,450		Other districts	4,312
Derbyshire	12,648	SCOTLAND—		
Northumberland....	9,768		Lanarkshire.....	15,822
Monmouthshire.....	9,307		Other districts	13,261
Nottinghamshire....	6,970	IRELAND.....		
			135	
Total, United Kingdom.....			202,130,000 tons.	

THE PRINCIPAL ARTICLES OF IMPORT.

MEAN ANNUAL VALUE, 1896-98.

	£1000.		£1000.	
Grain and flour.....	53,090	Eggs.....	4,333	
Cotton, raw.....	34,198	Coffee	3,630	
Wool (sheep and lambs')...	24,277	Tobacco	4,098	
Dead meat.....	27,367	Currants and raisins	1,894	
Sugar, raw and refined.....	17,177	Leather, dressed hides, &c.	7,673	
Butter and margarine.....	18,196	Wine	6,320	
Wood and timber	21,779	Cheese	5,252	
Silk manufactures	16,745	Metals—		
Flax, hemp, and jute.....	9,063	Copper ore, &c.	2,743	
Tea.....	10,445	" part wrought, &c.	3,173	
Woollen manufactures and yarn.....	11,467	Iron ore	4,083	
Animals (for food).....	10,735	" in bars.....	556	
Oils.....	8,147	" manufactures.....	6,088	
Chemicals, dye-stuffs, &c.	6,086	Lead.....	2,136	
Seeds.....	6,167	Tin.....	1,768	
Fruits and hops.....	7,301	Zinc and its manufactures	1,738	

* From *Statesman's Year Book*, 1899.

THE PRINCIPAL ARTICLES OF EXPORT (HOME PRODUCE).

MEAN ANNUAL VALUE, 1896-98.

	£1000.		£1000.
Cotton manufactures	56,447	Metals (<i>continued</i>)—	
" yarn.....	9,632	Iron, railroad, of all sorts	3,478
Total of cotton.....	66,079	" wire	848
Woollen manufactures	15,982	" tin plates.....	2,943
" and worsted yarn	5,040	" hoops, sheets, and	
Total of woollen and		plates.....	3,492
worsted.....	21,022	" cast and wrought,	
Linen manufactures.....	4,730	of all sorts	4,774
" yarn.....	968	" for re-manufacture	272
Jute manufactures.....	2,122	Steel and manuf. partly	
" yarn	458	iron.....	4,109
Apparel and haberdashery..	6,470	Total of iron and steel	23,728
Metals—		Hardware and cutlery.....	2,072
Iron, pig.....	2,720	Copper.....	2,624
" bar, angle, bolt, and		Machinery.....	17,216
rod.....	1,092	Coals, cinders, fuel, &c.	16,649
		Chemicals	8,438

TONNAGE OF VESSELS ENTERED AND CLEARED AT THE PRINCIPAL PORTS OF THE UNITED KINGDOM, 1898.

PORTS.	Entered.	Cleared.	Total.	PORTS.	Entered.	Cleared.	Total.
	1000	1000	1000		1000	1000	1000
	tons.	tons.	tons.		tons.	tons.	tons.
London	9,438	7,158	16,596	Leith	1,024	953	1,977
Liverpool ...	6,170	5,998	12,168	Sunderland.	811	1,151	1,962
Cardiff.....	3,189	5,600	8,789	Swansea.....	713	1,209	1,922
Tyne Ports*	3,678	4,531	8,209	Dover	909	896	1,805
Hull.....	2,467	2,161	4,628	Middlesbro'.	920	863	1,783
Glasgow....	1,458	2,227	3,685	Newport.....	627	994	1,621
Southampton	1,549	1,375	2,924	Dublin.....	210	101	311

* Exclusive of Blyth.

TRADE OF THE UNITED KINGDOM WITH DIFFERENT COUNTRIES IN 1898.

COUNTRIES.	Imports from.	Exports of Home Produce to.	Exports of Foreign and Colonial Produce to.	Total Trade.
BRITISH POSSESSIONS.	£1000.	£1000.	£1000.	£1000.
India.....	27,470	29,730	633	57,833
Australasia.....	28,850	21,123	2,307	52,280
British North America	20,755	6,155	1,386	28,296
South and East Africa *....	6,174	12,457	962	19,593
Straits Settlements	3,942	2,773	44	6,759
Ceylon.....	4,848	1,177	63	6,088
British West Africa	2,352	2,000	289	4,641
British West Indies.....	1,283	1,840	259	3,382
Hong-kong.....	727	2,225	123	3,075
Channel Islands.....	1,553	1,068	231	2,852
British Guiana	576	607	116	1,299
Malta and Gozo.....	93	791	140	1,024
Mauritius.....	101	239	22	362
All other Possessions.....	710	1,242	109	2,061
Total British Possessions..	99,434	83,427	6,684	189,545
FOREIGN COUNTRIES.				
United States.....	126,062	14,716	13,818	154,596
France.....	51,397	13,706	6,808	71,911
Germany.....	28,534	22,526	10,806	61,866
Holland †.....	28,533	8,618	4,427	41,578
Belgium †.....	21,534	8,802	5,049	35,385
Russia.....	19,489	9,228	4,959	33,676
Spain	13,188	2,848	658	16,694
Denmark ‡.....	11,703	3,338	582	15,623
Sweden.....	9,737	3,998	1,313	15,048
Argentine Republic	7,788	5,586	226	13,600
Egypt.....	8,856	4,419	208	13,483
Forward.....	326,821	97,785	48,854	473,460

* The products of the Boer Republics pass through and are reckoned with either British South Africa or Portuguese East Africa.

† Many imports from Dutch and Belgian ports really come from Germany.

‡ Includes Iceland and Greenland.

COUNTRIES.	Imports from.	Exports of Home Pro- duce to.	Exports of Foreign and Colonial Produce to.	Total Trade.
	£1000.	£1000.	£1000.	£1000.
FOREIGN COUNTRIES (<i>continued</i>).				
Brought forward.....	326,821	97,785	48,854	473,460
Turkey, Europe and Asia.	4,881	6,118	412	11,411
Brazil.....	4,602	6,196	254	11,052
Italy.....	3,332	5,648	637	9,617
Norway.....	4,986	2,441	753	8,180
China.....	2,668	5,039	60	7,767
Japan.....	1,158	4,913	149	6,220
Portugal.....	3,448	1,530	556	5,534
Chile.....	3,634	1,697	159	5,490
Romania.....	2,580	1,333	50	3,963
Austria-Hungary.....	1,135	1,672	616	3,423
Greece.....	1,448	1,140	119	2,707
Peru.....	1,537	806	114	2,457
Java.....	407	1,915	18	2,340
Mexico.....	264	1,752	166	2,182
Foreign West Africa.....	622	1,248	86	1,956
Central America.....	1,171	550	19	1,740
Philippine Islands.....	1,497	216	13	1,726
Uruguay.....	392	1,256	48	1,696
Foreign East Africa *	92	1,210	151	1,453
Colombia.....	635	790	26	1,451
Algeria.....	676	301	3	980
Morocco	386	433	117	936
Tunis and Tripoli	399	368	15	782
Spanish West Indies	18	274	335	627
Ecuador.....	267	323	18	608
Persia.....	193	317	21	531
Venezuela.....	46	469	3	518
Bulgaria	95	303	15	413
Haïti, Santo Domingo	91	196	7	294
Siam	64	211	4	279
All other Countries.....	1,400	1,482	173	3,055
Total Foreign Countries ..	370,945	149,932	53,971	574,848
Grand Total.....	470,379	233,359	60,655	764,393

* Practically only Portuguese East Africa.

COMPARATIVE PRICES OF COMMODITIES, 1898.*

COMMODITIES.	Mean, circa.	Min.	Max.
MINERALS—			
Iron, Scotch Pig..... per ton	2 7 0	2 5 4½	2 9 6
" Cleveland Bars..... "	5 10 0	5 5 0	6 2 6
" Steel Rails..... "	4 11 0	4 10 0	4 12 6
Coals, Best Wallsend, London. "	0 16 3	0 14 6	0 17 0
Copper, G. M. B..... "	51 9 6	48 5 0	56 16 3
Tin, Straits..... "	70 11 0	62 19 3	83 5 0
Lead, English Pig..... "	13 3 9	12 9 3	14 3 9
Saltpetre, English Refined... per cwt.	1 0 0	1 0 0	1 0 6
TEXTILE MATERIALS—			
Cotton, Raw, middling Up- land..... per lb.	0 0 3½	0 0 3	0 0 3½
" Yarn, 40 Mule Twist. "	0 0 6½	0 0 6½	0 0 6½
Wool, So. Down Hogs..... "	0 0 9	0 0 8½	0 0 9½
" N. S. Wales Greasy, Average..... "	0 0 8½	0 0 7½	0 0 8½
Silk, Cossimbuzar..... "	0 10 6	0 9 4½	0 10 9
Flax, Riga ZK..... per ton	24 12 6	24 0 0	25 10 0
Hemp, Manila †..... "	25 0 0	17 0 0	33 10 0
Jute, Good Marks..... "	0 12 0	0 11 0	0 13 0
FOOD PRODUCTS—			
Wheat, American †..... per qr.	1 17 0	1 9 6	2 10 0
" British † "	1 14 0	1 5 9	2 6 3
Barley, " "	1 7 2	1 3 4	1 8 6
Oats, " "	0 18 5	0 16 7	1 1 0
Flour, Town Household..... per 280 lb.	1 10 3	1 4 6	1 17 6
Beef, inferior..... per 8 lb.	0 2 4	0 2 0	0 2 8
" prime..... "	0 4 1	0 3 10	0 4 4
Mutton, " "	0 5 6	0 5 0	0 5 10
Potatoes, Good English..... per ton	4 10 0	3 10 0	6 0 0 †
Rice, Rangoon..... per cwt.	0 7 1	0 5 9	0 8 0
FOR DRINKING, LIGHTING, &c.—			
Sugar, Beet..... per cwt.	0 9 6½	0 9 1½	0 10 1½
" West India Syrups... "	0 10 5	0 9 3	0 11 6
Tea, Congou, common..... per lb.	0 0 4½	0 0 3½	0 0 7
" " good..... "	0 0 11	0 0 10	0 1 1
Coffee, Ceylon low mid..... per cwt.	4 16 0	4 5 0	5 0 0
Oils, Petroleum..... per gal.	0 0 4½	0 0 5	0 0 5½
" Olive, Spanish..... per tun	31 15 0	30 10 0	33 5 0
Tallow, Town..... per cwt.	1 2 0	1 1 6	1 4 6

* Calculated or quoted from the list published by the *Economist*, 14th Jan. 1899. The teacher will find a price-list of commodities in the *Economist* (price 8d.). He is recommended to buy a mid-month issue, as it contains a supplement giving monthly trade returns as well as prices.

† Exceptional year, owing to war.

|| Mean from *Agricultural Returns*, 1898.

‡ Exceptional year.

¶ New potatoes.

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